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ABSTRACT

This resource contains all available occupational, student organization, classroom management, and competency documentation information for those trade and industrial programs taught in Virginia. Its primary purpose is to assist teachers and curriculum specialists in developing instructional materials that meet competency-based education (CBE) standards and requirements for vocational and adult programs. Section I on occupational information provides specific information concerning the occupational nature of the work and references to sources listing places of employment, training, qualifications, employment outlook, working conditions, and salary. Section II provides information about the role of student organizations in vocational education and about the specific activities of the Vocational Industrial Clubs of America. Section III illustrates samples of classroom management systems developed by teachers incorporating competency-based vocational education techniques into their courses and programs, including lesson plans, student task sheets, learning contracts, self-contained learning systems, and task board management system. Section IV contains information on the characteristics of grading and recording systems for CBE. It contains sample classroom, permanent record, and recording systems, including an example of the newly developed Virginia Trade and Industrial Instructional Management System. (YLB)

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Trade and Industrial Education

Service Area Resource

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Commonwealth of Virginia
Department of Education
Vocational and Adult Education
Richmond, Virginia 23216

1984

CE 051404

Review Draft

COMPETENCY-BASED CBE EDUCATION

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SERVICE AREA RESOURCE

FOR

TRADE AND INDUSTRIAL EDUCATION

Developed by

Virginia Vocational Curriculum Center
Henrico County Public Schools
Department of Vocational and Community Education
Glen Allen, Virginia 23060

In cooperation with

Trade and Industrial Education Service
Vocational and Adult Education
Virginia Department of Education
Richmond, Virginia 23216

1984

FOREWORD

In the next decade, businesses and industries in Virginia will require large numbers of skilled workers. Therefore, vocational education at the secondary and postsecondary levels will have the responsibility of preparing individuals for a variety of occupations.

Competency-based education (CBE) provides the preparation students need for entry into the Virginia work force. The CBE practice of recording competencies developed by students helps them to make a smooth transition between secondary and postsecondary programs when both levels of education are required for career training. In addition, CBE is effective in retraining workers who have been displaced because of changing technology.

This resource will assist teachers and administrators in developing instructional materials that meet the needs of students and industry and comply with the Virginia CBE standards for vocational and adult education.

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The coordination, preparation, and design of the resource and other original material appearing in this publication are the products of the Virginia Vocational Curriculum Center, administered by the Henrico County Public Schools, Department of Vocational and Community Education:

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INTRODUCTION

This service area resource for Trade and Industrial Education has been developed as part of a statewide effort to implement competency-based education (CBE) in state vocational programs. The development of this resource and the total implementation effort are based on the 1978-79 Virginia State Plan for Vocational Education which contains the following objectives:

> By June 30, 1982, each school division shall have implemented competency-based instruction in approved vocational education programs based on V-TECS and IDECC catalogues, if available, or other competency-based materials as reported in the annual Local Evaluation Programs, and each community college shall have implemented competency-based instruction in at least one program based on V-TECS materials as reported by the Virginia Community College System.

Although 1982 is designated in the above objective, the date has been extended and full implementation of competency-based education now is planned for 1984.

In addition to this state plan objective and previous efforts by state educators to implement CBE, the Virginia Department of Education has adopted the following CBE standards and requirements for vocational programs:

Standard I. ROLE-RELEVANT COMPETENCIES ARE IDENTIFIED AND STATED.

Requires:
- A. A validated task/competency list for each vocational program
- B. A performance objective for each validated task/competency.

Standard II. COMPETENCIES ARE SPECIFIED TO STUDENTS PRIOR TO INSTRUCTION

Requires: A system for providing task/competency information to students prior to instruction.

Standard III. CRITERION-REFERENCED MEASURES ARE USED TO MEASURE ACHIEVEMENT OF COMPETENCIES

Requires:

A. A criterion-referenced measure for each validated task/competency

B. A testing and evaluation procedure which tests the performance objective and is criterion-based.

Standard IV. A SYSTEM EXISTS FOR DOCUMENTING THE COMPETENCIES ACHIEVED BY EACH STUDENT.

Requires: A system that has task/competency records/profiles for student achievement in each vocational program, course, or unit.

This service area resource for Trade and Industrial Education is designed to combine, in one package, all available occupational, student organization, classroom management, and competency documentation information for those trade and industrial programs taught in Virginia. In those programs/courses for which instructional resource guides already exist, these items of information have been updated and expanded. In those programs/courses for which instructional resource guides are not yet available, the service area resource can be coordinated with either a separate task analyses guide (to be distributed at a later date) or the relevant manual materials from Mid-America.

PURPOSE

The primary purpose of this resource is to assist the teacher and curriculum specialist in developing instructional materials which are competency based and meet CBE standards and requirements for vocational and adult programs. It may be used to update vocational programs currently being offered. The materials contained in this resource are designed for planning by instructional personnel rather than for direct use by the students.

ORGANIZATION

This resource is divided into the following sections:

I. Occupational Information

Specific information concerning the occupational nature of the work and references to sources listing places of employment, training, qualifications, employment outlook, working conditions, and salary are provided in this section. The information is useful for preparing instructional activities and for counseling students.

II. Student Organizations

Information about the role of student organizations in vocational education and about the specific activities of the Vocational Industrial Clubs of America (VICA), including national and state Skill Olympics, is provided in Section II.

III. Classroom Management Systems

Several sample classroom management and delivery systems have been included in this section. The systems have been field-tested and are intended to assist the teacher in using competency-based materials in the classroom and laboratory/shop.

IV. Recording Systems

Recordkeeping systems have been developed to assist the teacher in documenting successful student achievement of competencies. This section contains sample classroom, permanent record, and recording systems, including an example of the newly developed Virginia T & I Instructional Management System.

A task analyses package is available for some courses in Trade and Industrial Education. Each package contains the following information:

Section 1. Task Inventory

This section contains a listing of validated task/competency statements for incumbent workers. Included are program and course titles, performance and enabling objectives, and criterion references related to the task. The task list is arranged by worker duty areas only. No attempt has been made to sequence the tasks in this section of the publication.

Section 2. Programs and Courses

This section contains a description, task sequence list, and outline for the specific course. Course information is preceded by a description of Trade and Industrial Education programs and program options which incorporate the course.

Task analyses packages developed in the future will include a Virginia T & I Instructional Management System form relating the task/competencies taught in a course with the occupational titles identified for that program.

When the task analyses package is used in conjunction with the relevant occupational information in Section I and the material in Sections II, III, and IV of the service area resource, a complete instructional resource guide for a specific course offering is available for implementing a competency-based Trade and Industrial Education program.

Also available for many courses are volumes of instructional materials manuals from the Oklahoma Department of Education (Mid-America). These manuals can be coordinated with existing task analyses or used alone, and contain job sheets, transparency masters, tests, and other items for direct use with students.

NOTE: Local advisory committees should validate Mid-America task inventories before they are integrated into a Virginia vocational program.

TERMINOLOGY

ARTICULATION: A planned process within an educational system that coordinates instructional programs which will enable students to move from one instructional level to another or from one institution to another at the same instructional level without unnecessary duplication or gaps in the instructional program.

CHECKLIST: A list of activities or behaviors that are checked by a student, teacher, or observer as being completed during a particular observation session; frequently used to assess student performance in the psychomotor and affective domains of learning.

COMPETENCY: Demonstrated ability (including knowledge, skills, or attitudes) to perform a specific task successfully in order to meet a specified standard.

COMPETENCY-BASED EDUCATION (CBE): Educational programs in which required knowledge, skills, and attitudes are based on role-relevant competencies.

COMPETENCY-BASED EDUCATION STANDARDS: Standards for CBE in Virginia: (1) role-relevant competencies are identified and stated; (2) competencies are specified to students prior to instruction; (3) criterion-referenced measures are used to assess achievement of competencies; and (4) a system exists for documenting the competencies achieved by each student.

COMPETENCY RECORD/PROFILE: A document that provides specific information concerning student achievement of competencies in CBE courses or programs, including the following information: student name, program title, listing of all terminal competencies, enabling competencies (if required), rating scale, and method for authenticating the record.

CONTENT/CONCEPT: A distinct grouping of tasks which are related to each other by the nature of the activity performed.

CRITERION (criteria): The standard(s) required for a student to reach mastery of an objective.

CRITERION-REFERENCED MEASURE (CRM): A test, test item, or a statement which describes how a student will be tested and/or evaluated. The CRM is based on the task/competency standard or criterion, as illustrated in the following examples:

Examples: Psychomotor

Tune an adjusted carburetor in accordance with the manufacturer's specifications within 45 minutes.

Cognitive

Identify nine out of ten technical terms used in masonry on a written test.

Affective

Exhibit positive attitudes in the vocational classroom and laboratory. Your attitudes will be evaluated by the Program Attitude Checklist.

CRITERION-REFERENCED TESTING: A process of testing which yields measurements that are directly interpretable in terms of specified performance standards. An individual's performance is compared to a criterion, the criterion being the work of performance standard. Therefore, criterion-referenced testing is based on absolute standards stemming from the competency rather than relative standards such as class standing (also called criterion-referenced evaluation, objective-referenced testing, proficiency testing, or domain-referenced testing).

CURRICULUM: Objectives, content, and learning activities arranged in a learning sequence for a particular instructional area. An orderly arrangement of integrated topics, activities, and experiences which students pursue for the attainment of a specified educational goal.

DUTY AREA: A major segment of the work involved in an occupation; composed of a group of tasks which are related to each other by the nature of the work to be performed.

ENABLING OBJECTIVE: A sub-goal that identifies one thing a learner must be able to know or to do to complete the performance objective.

ENTRY-LEVEL SKILLS: The set of competencies required of a beginning worker in an occupation for immediate productivity upon entering that occupation.

JOB/OCCUPATION: The composite of duties and tasks performed regularly in one's trade, occupation, or profession.

INSTRUCTIONAL ACTIVITIES: Educational activities completed by the students to learn specific competencies (also called learning strategies).

INSTRUCTIONAL MATERIALS MANUAL: A document that includes material for direct classroom use, such as job sheets, worksheets, transparency masters, tests, checklists, etc. In Trade and Industrial Education, the Mid-America materials represent these manuals.

INSTRUCTIONAL RESOURCE GUIDE: One or more documents including detailed information for developing competency-based courses and programs. The guides include information concerning the occupational or program domain, task list, performance and enabling objectives, criterion-referenced measures, learning activities, tools/materials, references, program and course descriptions, course content outlines, classroom management systems, student recording systems, and additional resources.

OCCUPATIONAL DOMAIN: A group or listing of occupations within a vocational area that share common experiences, knowledge, and skill requirements, such as manufacturing occupations and construction occupations.

PERFORMANCE: A clear statement of what the learner will be able to do after mastery status has been obtained.

PERFORMANCE OBJECTIVE: A statement in precise measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

a. Condition--The performance situation confronting the learner is clearly specified. This specification includes equipment provided or withheld and environmental constraints such as temperature and space.

b. Performance--The specific behavior expected of the learner is stated.

c. Standard (criterion)--The degree of acceptable performance is specified. This may be quantitative, qualitative, or both. If quantitative, 100% proficiency is assumed unless otherwise stated. In the standard, ". . . locate shorts in an ignition system," it is assumed that all shorts must be located, compared to, "locate three of four shorts existing in an ignition system." If qualitative, the standard is explicitly stated, e.g., ". . . measure the bearing to within .005 of that found by the instructor."

STANDARD: That part of a performance objective or criterion-referenced measure which describes how well or to what proficiency level a task must be performed (also called performance level, criterion, or work standard).

TASK: A unit of work activity or operation that constitutes a logical and necessary step in the performance of a duty. For example:

Job/Occupation	Duty	Task
Electrician	Laying out residential wiring	Calculate lighting requirements

TASK ANALYSIS: An organized method for identifying roles, responsibilities, and jobs performed by workers in an occupation or content in non-occupational courses. Task analyses are used in CBE to establish instructional content and scope.

TASK INVENTORY: A list of tasks performed by workers in an occupational domain (also called job inventory) or what is required to be taught in a nonoccupational course (industrial arts, general business, exploratory, etc.).

VALIDATION: A procedure used to determine and verify if tasks/competencies identified for a vocational program are valid.

HOW TO USE THE SERVICE AREA RESOURCE AND RELATED CBE MATERIALS

The content and format of this resource, when used in conjunction with separate task analyses, or manuals from Mid-America, provide the occupational and related information needed to implement CBE programs in a systematic manner.

The following steps should be followed when using these materials to implement CBE in a vocational program or course:

Using the Resource

1. Review occupational information. Section I contains information concerning the occupational domain, which may be used to give students a general overview of the career opportunities in the field of trade and industrial occupations. When setting up a specific program or course, study the guide application chart located on the inside front cover of the separate task analyses package to determine whether the guide includes the occupational titles and courses appropriate for the local setting. Extract the needed occupational information from Section I.

Using the Separate Task Analyses or Mid-America Package

2. Review tasks. Review the task inventory to determine whether all task/competencies are included for the region or locality in which the program or course is offered. If additional task/competencies are required for the program/course, include them in the instructional program.

3. Review outlines and sequenced competencies. If a task analyses package is available, review the task sequence listing and content outline referenced to the task inventory. Revise the course outlines if additional task/competencies have been identified or if the sequencing needs to be changed. If no task analylses package exists for a particular course, review the sequence of Mid-America tasks to ensure that it meets all local requirements.

4. Develop or select evaluation materials. Construct criterion-referenced tests and assessment materials, using the criterion-referenced measures provided on the task inventory sheets in Section 1. Develop criterion-referenced measures and tests for all additional competencies identified. Evaluate tests provided by Mid-America for compatibility with local objectives.

5. Develop or select instructional materials. Develop or select instructional materials such as student handouts, learning packages, job sheets, or transparency masters. Review Mid-America materials to determine compatibility with the competencies identified locally for the program/course. Resources for the suggested learning ativities are included on the task inventory sheets in Section 1 of the task analyses guide.

Using the Resource

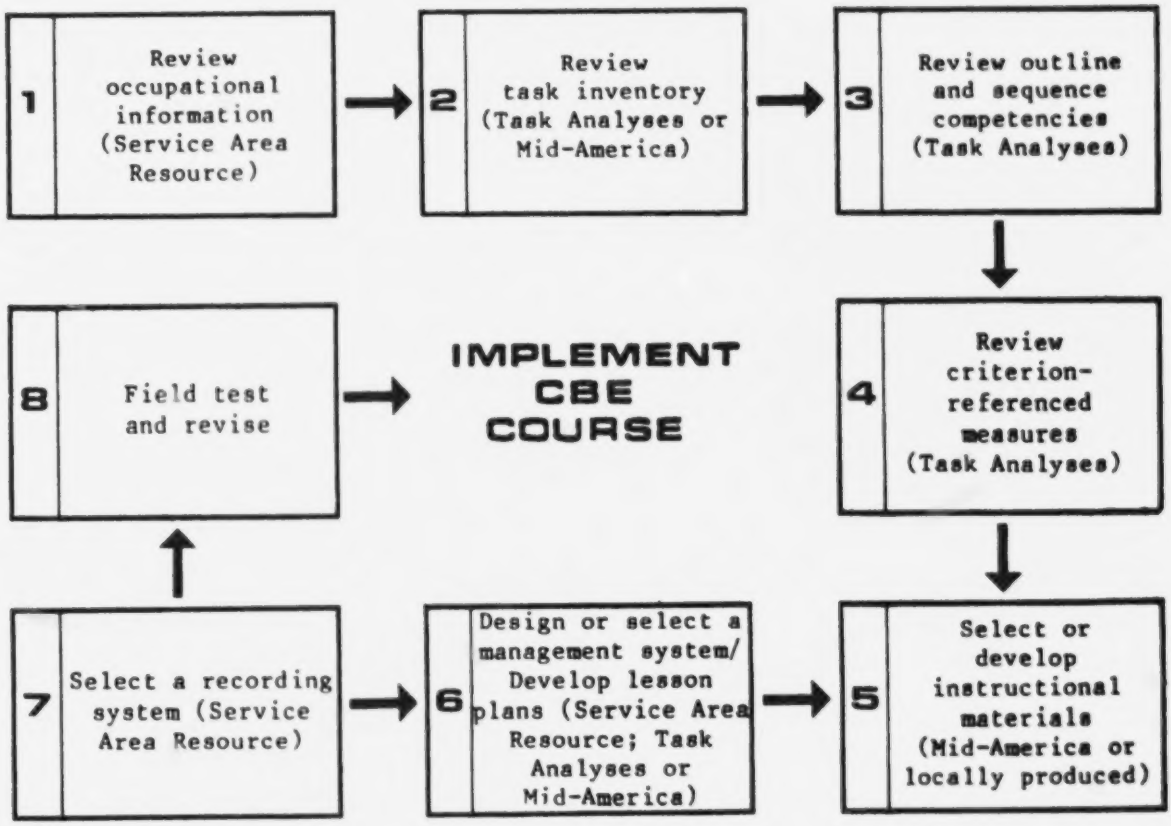
6. Develop or select a management system. Review the classroom management or delivery systems in Section III, and modify if necessary to meet individual requirements. Information on VICA is contained in Section II for ease of integration into classroom activities.

7. Design or select a recording system. Design or select a student recording system from Section IV. The decision to select a particular recording system will depend on program requirements and local administrative procedures. A variety of sample system designs has been included in this resource.

Field Testing

8. Field test and revise instructional materials. This is the final step prior to the implementation of CBE in a vocational program.

The use of the service area resource and the specific task analyses or Mid-America manual for implementing CBE in a vocational program or course is illustrated by the following diagram:


1
Review occupational information (Service Area Resource)
2
Review task inventory (Task Analyses or Mid-America)
3
Review outline and sequence competencies (Task Analyses)
4
Review criterion-referenced measures (Task Analyses)
5
Select or develop instructional materials (Mid-America or locally produced)
6
Design or select a management system/ Develop lesson plans (Service Area Resource; Task Analyses or Mid-America)
7
Select a recording system (Service Area Resource)
8
Field test and revise
IMPLEMENT CBE COURSE

The preceding procedure may be modified to meet local program requirements and needs. It is important to realize that these materials represent only one resource and that additional materials may be necessary to meet the employment requirements of industry. Further information concerning the implementation of CBE is provided in Guide for Implementing Competency-Based Education in Vocational Programs, Virginia Department of Education.[1]

[1]Ralph A. Horne, Guide for Implementing Competency-Based Education in Vocational Programs, Field Review Draft (Richmond: Virginia Department of Education, 1981).

This service area resource will be revised periodically to provide updated information on programs, courses, and new technology, in order to assist Trade and Industrial Education teachers and counselors in their efforts to aid students in choosing and preparing for careers.

SECTION I.

OCCUPATIONAL INFORMATION

This section, consisting of two parts, provides information for teachers and counselors to use when presenting career information to students. First, listings of selected occupational titles related to each Trade and Industrial Education program available in Virginia have been compiled from the Dictionary of Occupational Titles[2] (DOT). Second, user information on the Virginia VIEW Microfiche Deck, which concentrates its career information on those jobs most in demand in Virginia, is described.

It may be helpful to duplicate occupational information from various references for students to use in making comparisons within a selected field of study. This material may be useful also in preparatory courses to aid in course selection and goal setting.

Career information can be studied for comparisons of such factors as earnings, training needed, and occupational growth, and the Occupational Outlook Handbook[3] is an example of a resource providing this type of information. Categories of occupational information available in this and similar resources may be identified as follows:

PLACES OF EMPLOYMENT: Includes the number of workers in a given occupation; a listing of the places with a description of numbers (most, many, some) of the places of employment; the areas of concentration, geographically or industrially; and the number of self-employed persons.

WORKING CONDITIONS: Lists the conditions common to different occupations, overtime work, environment, hazards, and outdoor/indoor occupations.

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[2]U.S. Department of Labor, Employment and Training Administration, Dictionary of Occupational Titles (4th ed.; Washington, D.C.: U.S. Government Printing Office, 1977).

[3]U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook (1980-81 ed.; Washington: U.S. Government Printing Office, 1980).

PREPARATION/TRAINING: Identifies the types of training required or preferred and where such training is available. (Note: Entry level jobs are most often found in office and service clusters, but some are found in sales, mechanical, and industrial clusters. The level at which a person enters an occupation and the speed at which the person advances frequently are determined by the amount of training completed by the individual.)

OTHER QUALIFICATIONS: Includes physical requirements, personality traits, aptitudes, and attitudes.

ADVANCEMENT: Summarizes the possibilities that exist with and without additional training; career ladder progression; patterns of movement from one occupation to another, if available; occupations which require little or no previous work experience; opportunities to transfer to other work of a similar nature; and licensing or certification requirements. (Note: Occupational skills gained in one job can make the worker more employable in another--perhaps a job that is more desirable in terms of earnings, working conditions, or scope for self-expression.)

WORKER FUNCTIONS/RELATIONSHIPS: Refers to the middle three digits in the DOT code, which rate the worker functions entailed in the particular job. (Note: The higher the number assigned, the less complex the function; conversely, the lower the number assigned, the more complex the level of responsibility and judgment required.)

SPECIALIZED TITLES: Refers to those that require similar aptitudes, interests, and education or training.

RELATED OCCUPATIONS: Refers to those that require similar aptitudes, interests, and education or training.

NATURE OF THE WORK: Describes the major duties of workers in the occupation or industry; what the workers do on the job; what tools and equipment they use; and how they do their work.

a. Lead Statement--Summarizes the entire occupation; the first sentence following the industry designation and alternate titles, if any.

b. Task Element Statements--Indicates the specific tasks the worker performs to accomplish the overall job purpose described in the lead statement.

c. May Items--Describes the duties required of workers in some establishments but not in others. (Note: The lead statements and the task element statements are included in this presentation.)

EMPLOYMENT OUTLOOK: Presents data as follows:

PROJECTED 1978-90 CHANGE IN EMPLOYMENT REQUIREMENTS

____ Much faster than average	50.0 percent or more
____ Faster than average	25.0 to 49.9 percent
____ About as fast as average	15.0 to 24.9 percent
____ More slowly than average	5.0 to 14.9 percent
____ Little change	4.9 to -4.9 percent
____ Decline	-5.0 percent or more

Openings due to: ____ Annual replacements
____ Growth of industry

EARNINGS: Includes items such as salary/wages, overtime, night shift, irregular hours, tips, and differences in earnings within given occupations. (Note: Generally, earnings are compared to the average earnings of workers in private industry who are not supervisors and not in farming. This group represented about 60 percent of all workers in 1978. Salaries may vary according to geographic location, type of industry, and type of work performed.)

BENEFITS: Contains an overall listing of benefits available; however, advantages not listed also may be available.

Occupational information is presented on the following pages in relation to the categories described. For further information, write:

Executive Director of VOICC
(Virginia Occupational Information Coordinating Committee)
Virginia Employment Commission
P. O. Box 1358
Richmond, Virginia 23211

USING VIRGINIA VIEW TO OBTAIN OCCUPATIONAL INFORMATION

The Virginia Vital Information Education Workshops (VIEW) Microfiche Deck is one part of a career information delivery system sponsored by the Virginia Occupational Information Coordinating Committee to deliver educational and occupational information to citizens of the Commonwealth. Other means of delivering the career information are (1) the Toll-Free Career Information Hotline (1-800-542-5870); (2) publications, including the Dictionary of Licensed Occupations in Virginia, the Dictionary of Apprenticeships Occupations in Virginia, the Forum newsletter, and occupational briefs modified for making transparencies on 25 occupations for classroom use in career counseling and career education; and (3) the computerized delivery system used in conjunction with the microfiche deck.

The Virginia VIEW Career Information System is available at no cost to a variety of users and user agencies, including secondary and middle schools, community colleges, and private and public colleges and universities.

The Virginia VIEW Microfiche Deck contains 70 microfiche. The deck is divided into eight parts: 52 fiche cards containing 345 VIEWSCRIPTS (occupational briefs) arranged alphabetically within seven Data-People-Things Clusters; 4 fiche cards (tan) containing information on postsecondary schools in Virginia, including community colleges, two-year public and private institutions, public colleges and universities, and proprietary schools; 4 fiche cards (white) on financial aid; 1 fiche card (gold) listing additional training and the vocational education directors; 1 fiche card (brown) on apprenticeship program in Virginia; 2 fiche cards (blue) on military training opportunities; 4 fiche cards (light green) containing information on postsecondary school programs; and 1 fiche card (dark green) containing information on secondary school subjects.

Plans call for a microfiche deck to be issued each year, providing updated, current, and accurate information.

The 1982 Virginia VIEW Microfiche Deck presents information on 345 occupational titles and 1,269 related occupational specialties. The occupational titles were selected to represent the occupations in which most Virginians are presently employed, based on data from the Virginia Employment Commission. The microfiche decks are distributed without cost to the user agencies who provide their own readers or reader printers.

A microcomputer system has been developed to be used in conjunction with the microfiche deck. The microcomputer system is based on a Virginia VIEW self-assessment, Career Search, which is designed to assess seven key areas: interests, areas of work, physical strengths, physical capabilities, working conditions, educational levels, and temperaments. The user is able to key the results of the Career Search into a microcomputer which then provides the user with a list of occupations that might be considered. It also directs the user to the appropriate microfiche to obtain information about the selected occupations. There is no charge for the microcomputer software; however, a user must have access to a microcomputer.

Teachers may obtain more information on the access to and the use of the system from their school librarian, their divisional director of vocational education, or the following:

Project Director
Virginia VIEW
Virginia Polytechnic Institute and State University
301 University City Office Building
Blacksburg, Virginia 24061
Phone: (703) 961-7158

COORDINATING OCCUPATIONAL INFORMATION WITH THE VIRGINIA T & I MANAGEMENT SYSTEM

The selected occupational titles listed on the following pages can be used with the Virginia T & I Management System recording form (see Section IV) to provide students with valuable career counseling information.

Each secondary program in Trade and Industrial Education and related information are presented on a separate page. In addition to the secondary program title, CIP Code, and course titles and numbers, the related post-secondary program(s) offered through the Virginia Community College System are identified. Students interested in course descriptions in these community college programs should be referred to the VCCS Curriculum Guide[4] or to the admissions office of their local community college.

Selected titles compiled from the Dictionary of Occupational Titles which relate to the program of study are also identified. The lists should be added to or deleted from to suit local industry requirements, if necessary, and students referred to actual job descriptions contained in the DOT.

The selected DOT titles for a program can be entered on the Virginia T & I Management System recording form. Each task taught in the course may be directly correlated with corresponding DOT(s). An example of this correlation is shown in Section IV.

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[4]Virginia Community College System State Curriculum Guide (Course Update Only) for 1983-84 (Richmond: Virginia Community College Sytem, 1983).

SELECTED OCCUPATIONAL TITLES
RELATED TO SECONDARY PROGRAMS

TRADE AND INDUSTRIAL EDUCATION

Air conditioning and refrigeration
Appliance repair
Auto body repair
Auto mechanics
Auto servicing
Barbering
Building maintenance
Building trades
Cabinetmaking
Carpentry
Carpentry/cabinetmaking
Commercial art
Commercial foods
Commercial photography
Commercial sewing
Cosmetology
Drafting
Electricity
Electronics
Heavy duty equipment mechanics
Industrial maintenance mechanic
Machine shop
Maintenance & repair
Masonry
Metal trades
Mine machinery repair
Plumbing
Power mechanics
Printing
Radio & TV communications
Radio & TV repair
Sheet metal
Small engine repair
Tailoring
Upholstery
Welding

SECONDARY PROGRAM: Air Conditioning and Refrigeration

CIP CODE: 47.0201

SECONDARY COURSES: Air Conditioning and Refrigeration I (8503)
Air Conditioning and Refrigeration II (8504)
Air Conditioning and Refrigeration III (8505)

POSTSECONDARY PROGRAM (VCCS): Air Conditioning and Refrigeration (AIRC)

OCCUPATIONAL TITLE	DOT NUMBER
Air Conditioning Installer, Domestic	827.464-010
Air Conditioning Installer/Servicer	637.261-010
Air Conditioning Installer/Service Helper	637.867-010
Air Conditioning Mechanic	637.261-014
Air Conditioning Mechanic Helper	637.664-010
Furnace Installer/Repairer, Hot Air	869.281-010
Refrigeration Mechanic	637.261-026
Refrigeration Mechanic Helper	637.687-014
Refrigeration Mechanic (Test Equipment)	827.361-014

SECONDARY PROGRAM: Appliance Repair

CIP CODE: 47.0106

SECONDARY COURSES: Appliance Repair I (8616)
Appliance Repair II (8617)
Appliance Repair III (8618)

POSTSECONDARY PROGRAM (VCCS): Appliance Servicing (APPL)

OCCUPATIONAL TITLE	DOT NUMBER
Appliance Repairer	723.584-010
Electrical Appliance Repairer	723.381-010
Electrical Appliance Servicer	827.261-010
Electrical Appliance Servicer Apprentice	827.261-014
Gas Appliance Servicer	637.261-018
Gas Appliance Servicer Helper	637.684-010
Household Appliance Installer	827.661-010

SECONDARY PROGRAM: Auto Body Repair

CIP CODE: 47.0603

SECONDARY COURSES: Auto Body Repair I (8676)
Auto Body Repair II (8677)
Auto Body Repair III (8678)

POSTSECONDARY PROGRAM (VCCS): Automotive (AUTO)

OCCUPATIONAL TITLE	DOT NUMBER
Automobile-Body Customizer	807.361-010
Automobile-Body Repairer	807.381-010
Automobile-Body Repairer Helper	807.687-010
Automobile-Bumper Straightener	807.684-010
Automobile Damage Estimator	241.267-014
Automotive Painter	845.381-014
Automotive Painter Apprentice	845.381-010
Frame Straightener	807.484-010
Shop Estimator	807.267-010
Taper-Sander	749.687-018

SECONDARY PROGRAM: Auto Mechanics

CIP CODE: 47.0604

SECONDARY COURSES: Auto Mechanics I (8506)
Auto Mechanics II (8507)
Auto Mechanics III (8508)

POSTSECONDARY PROGRAM (VCCS): Automotive (AUTO)

OCCUPATIONAL TITLE	DOT NUMBER
Air Conditioning Mechanic	620.281-010
Automobile Electrician	825.281-022
Automobile Mechanic	620.261-010
Automobile Mechanic Helper	620.684-014
Automobile Repair Service Estimator	620.261-018
Brake Repairer	620.281-026
Carburetor Mechanic	620.281-034
Front-End Mechanic	620.281-038
Muffler Installer	807.664-010
Transmission Mechanic	620.281-062
Tune-Up Mechanic	620.281-066

SECONDARY PROGRAM: Auto Servicing

CIP CODE: 47.0601

SECONDARY COURSES: Auto Servicing I (8710)
Auto Servicing II (8711)
Auto Servicing III (8712)

POSTSECONDARY PROGRAM (VCCS): Automotive (AUTO)

OCCUPATIONAL TITLE	DOT NUMBER
Automobile Accessories Salesperson	273.357-030
Automobile Repair Parts Clerk	222.367-042
Equipment Inventory Clerk	222.387-026
Self-Service Station Attendant	915.477-010
Service Station Attendant	915.467-010

SECONDARY PROGRAM: Barbering

CIP CODE: 12.0402

SECONDARY COURSES: Barbering I (8509)
Barbering II (8510)
Barbering III (8511)

POSTSECONDARY PROGRAM (VCCS): None identified

OCCUPATIONAL TITLE	DOT NUMBER
Barber	330.371-010
Barber Apprentice	330.371-014
Haircutter	330.371-010
Hairstylist	332.271-018

SECONDARY PROGRAM: Building Maintenance

CIP CODE: 46.0401

SECONDARY COURSES: General Maintenance Mechanic I (8590)
General Maintenance Mechanic II (8591)
General Maintenance Mechanic III (8592)

POSTSECONDARY PROGRAM (VCCS): Building (BLDG)

OCCUPATIONAL TITLE	DOT NUMBER
Bricklayer	861.381-018
Building Maintenance Repairer	899.381-010
House Repairer	869.381-010
Maintenance Carpenter	860.281-010
Maintenance Carpenter Helper	869.664-014
Manufactured Building Repairer	869.384-010
Plumber	862.681-010
Residential Electrician	824.681-010

SECONDARY PROGRAM: Building Trades

CIP CODE: 46.9999

SECONDARY COURSES: Building Trades I (8515)
Building Trades II (8516)
Building Trades III (8517)

POSTSECONDARY PROGRAM (VCCS): Building (BLDG)

OCCUPATIONAL TITLE	DOT NUMBER
Bricklayer	861.381-018
Bricklayer Apprentice	861.381-022
Bricklayer Helper	869.687-026
Carpenter	860.381-022
Carpenter Apprentice	860.381-026
Cement Mason Apprentice	844.364-014
Construction Worker I	869.664-014
Contractor	182.167-010
Electrician Helper	829.684-022
Painter	840.381-010
Painter Helper	869.687-026
Plumber Helper	869.664-014
Residential Electrician	824.681-010

SECONDARY PROGRAM: Cabinetmaking

CIP CODE: 48.0703

SECONDARY COURSES: Cabinetmaking I (8604)
Cabinetmaking II (8605)
Cabinetmaking III (8606)

POSTSECONDARY PROGRAM (VCCS):

Woodworking and Furniture Reconstruction (WOOD)
Furniture (FURN)

OCCUPATIONAL TITLE	DOT NUMBER
Cabinet Assembler	763.684-050
Cabinet and Trim Installer	869.684-026
Cabinet Finisher	703.684-014
Cabinet Maker	660.280-010
Cabinet Maker Apprentice	660.280-014
Shaper Operator	665.682-034
Variety Saw Operator	667.682-086

SECONDARY PROGRAM: Carpentry

CIP CODE: 46.0201

SECONDARY COURSES: Carpentry I (8601)
Carpentry II (8602)
Carpentry III (8603)

POSTSECONDARY PROGRAM (VCCS): Building (BLDG)

OCCUPATIONAL TITLE	DOT NUMBER
Acoustical Carpenter	860.381-010
Carpenter	860.381-022
Carpenter Apprentice	860.381-026
Carpenter I (Prefabricated Buildings)	860.664-010
Construction Worker I	869.664-014
Drywall Finisher	842.664-010
Drywall Installer	842.381-010
Form Builder	860.381-046
Maintenance Carpenter	860.281-010
Maintenance Carpenter Helper	869.664-014
Roofer Apprentice	866.381-014
Rough Carpenter	860.381-042
Siding Applicator	863.684-014

SECONDARY PROGRAM: Carpentry-Cabinetmaking

CIP CODE: 48.0799

SECONDARY COURSES: Carpentry-Cabinetmaking I (8518)
Carpentry-Cabinetmaking II (8519)
Carpentry-Cabinetmaking III (8520)

POSTSECONDARY PROGRAM (VCCS):

Building (BLDG)
Woodworking and Furniture Reconstruction (WOOD)
Furniture (FURN)

OCCUPATIONAL TITLE	DOT NUMBER
Cabinet Maker	660.280-010
Cabinet Maker Apprentice	660.280-014
Carpenter	860.381-022
Carpenter Apprentice	860.381-026
Finish Carpenter	860.381-022

SECONDARY PROGRAM: Commercial Art

CIP CODE: 48.0203

SECONDARY COURSES: Commercial Art I (8570)
Commercial Art II (8571)
Commercial Art III (8572)

POSTSECONDARY PROGRAM (VCCS): Arts (ARTS)

OCCUPATIONAL TITLE	DOT NUMBER
Airbrush Artist	970.281-010
Cartoonist	141.061-010
Cloth Designer	142.061-014
Commercial Designer	141.081-014
Copyist	142.281-010
Display Artist	142.051-010
Graphic Designer	141.061-018
Illustrator	141.061-022
Industrial Designer	142.061-026
Layout Former	970.381-018
Letterer	970.661-014
Package Designer	142.081-018
Printmaker	144.061-014
Screen Printer	979.684-034
Screen Print Machine Operator Helper	652.686-038
Silk Screen Printer (Machine)	652.665-010

SECONDARY PROGRAM: Commercial Foods

CIP CODE: 48.0499

SECONDARY COURSES: Commercial Foods I (8521)
Commercial Foods II (8522)
Commercial Foods III (8523)

POSTSECONDARY PROGRAM (VCCS): Hotel-Restaurant-Institutional Management (HRIM)

OCCUPATIONAL TITLE	DOT NUMBER
Baker	313.381-010
Baker Helper	313.684-010
Cafeteria Attendant	311.677-010
Caterer	187.167-016
Cook	313.361-014
Cook Helper	317.687-010
Cook, Short Order II	313.671-010
Counter Attendant	311.477-014
Dining Room Attendant	311.677-018
Food Service Worker	313.361-014
Kitchen Helper	318.687-010
Salad Maker	317.684-014
Waiter/Waitress, Formal	311.477-026
Waiter/Waitress, Informal	311.477-030

SECONDARY PROGRAM: Commercial Photography

CIP CODE: 48.0204

SECONDARY COURSES: Commercial Photography I (8607)
Commercial Photography II (8608)
Commercial Photography III (8609)

POSTSECONDARY PROGRAM (VCCS): Photography (PHTG)

OCCUPATIONAL TITLE	DOT NUMBER
Photofinishing Laboratory Worker	976.687-010
Photograph Finisher	976.487-010
Photographer Helper	976.667-010
Photographer, Still	143.062-030
Photojournalist	143.062-034

SECONDARY PROGRAM: Commercial Sewing

CIP CODE: 48.0399

SECONDARY COURSES:
Commercial Sewing I (8524)
Commercial Sewing II (8525)
Commercial Sewing III (8526)

POSTSECONDARY PROGRAM (VCCS): None identified

OCCUPATIONAL TITLE	DOT NUMBER
Hand Sewer	782.684-058
Sewing Machine Operator, Automatic	787.682-014
Sewing Machine Operator, Garments	787.682-046
Sewing Machine Operator, Semi-Automatic	786.685-030
Sewing Machine Operator, Textile	787.682-058
Tacking Machine Operator	786.685-034

SECONDARY PROGRAM: Cosmetology

CIP CODE: 12.0403

SECONDARY COURSES:

Cosmetology I (8527)
Cosmetology II (8528)
Cosmetology III (8529)
Beauty Salon Assistant I (8610)
Beauty Salon Assistant II (8611)
Beauty Salon Assistant III (8612)

POSTSECONDARY PROGRAM (VCCS): None identified

OCCUPATIONAL TITLE	DOT NUMBER
Beautician (Cosmetologist)	332.271-010
Beautician Apprentice	332.271-014
Beauty Salon Manager	187.167-058
Haircutter	330.371-010
Hairdresser	332.271-018
Manicurist	331.674-010
Scalp-Treatment Operator	339.371-014
Shampooer	332.271-010
Wig Stylist	261.351-010

SECONDARY PROGRAM: Drafting

CIP CODE: 48.0102

SECONDARY COURSES: Drafting I (8560)
Drafting II (8561)
Drafting III (8562)

POSTSECONDARY PROGRAM (VCCS): Drafting (DRFT)

OCCUPATIONAL TITLE	DOT NUMBER
Architectural Drafter	001.261-010
Assistant Drafter	017.281-018
Commercial Drafter	017.261-026
Detail Drafter	017.261-030
Heat and Ventilation Drafter	017.261-034
Landscape Drafter	001.261-014
Mechanical Drafter	007.281-010
Plumbing Drafter	017.261-038
Structural Drafter	005.281-014

SECONDARY PROGRAM: Electricity

CIP CODE: 46.0301

SECONDARY COURSES: Electricity I (8533)
Electricity II (8534)
Electricity III (8535)

POSTSECONDARY PROGRAM (VCCS): Electricity/Electronics (ELEC)

OCCUPATIONAL TITLE	DOT NUMBER
Cable Splicer	829.261-010
Contractor	182.167-010
Electrical Repairer	829.281-014
Electrician Apprentice	824.261-014
Electrician Helper	829.684-022
Equipment Installer	828.381-010
Industrial Electrician	824.261-010
Line Repairer	821.361-026
Residential Electrician	824.681-010
Shop Electrician	825.381-030

SECONDARY PROGRAM: Electronics

CIP CODE: 47.0101

SECONDARY COURSES: Electronics I (8536)
Electronics II (8537)
Electronics III (8538)

POSTSECONDARY PROGRAM (VCCS): Electricity/Electronics (ELEC)

OCCUPATIONAL TITLE	DOT NUMBER
Electronics Assembler	726.684-018
Electronics Mechanic	828.281-010
Electronics Mechanic Apprentice	828.281-014
Electronics Sound Technician	823.261-010
Electronics Technician	003.161-014
Electronics Tester	726.281-014
Electronics Worker	726.687-010

SECONDARY PROGRAM: Heavy Duty Equipment Mechanics

CIP CODE: 47.0302

SECONDARY COURSES:
Heavy Duty Equipment Mechanic I (8613)
Heavy Duty Equipment Mechanic II (8614)
Heavy Duty Equipment Mechanic III (8615)

POSTSECONDARY PROGRAM (VCCS): Heavy Equipment Technology (HVEQ)

OCCUPATIONAL TITLE	DOT NUMBER
Construction Equipment Mechanic	620.261-022
Construction Equipment Mechanic Helper	620.664-010
Diesel Mechanic	625.281-010
Fluid Power Mechanic	600.281-010
Fuel Injection Servicer	625.281-022
Heavy Equipment Repairer	620.381-022
Maintenance Mechanic	620.281-046

SECONDARY PROGRAM: Industrial Maintenance Mechanic

CIP CODE: 47.0399

SECONDARY COURSES: Industrial Maintenance Mechanics I (8575)
Industrial Maintenance Mechanics II (8576)
Industrial Maintenance Mechanics III (8577)

POSTSECONDARY PROGRAM (VCCS):

Mechanical Engineering Technology (MECH); Air Conditioning and Refrigeration (AIRC); Electricity/Electronics (ELEC); Welding (WELD)

OCCUPATIONAL TITLE	DOT NUMBER
Air Conditioning Mechanic	637.261-026
Air Conditioning Mechanic Helper	637.664-010
Arc Welder	810.384-014
Diesel Mechanic	625.281-010
Diesel Mechanic Helper	625.684-010
Drill Press Operator	606.682-014
Electric Motor Repairer	721.281-018
Electrical Repairer	829.281-014
Lathe Operator, Production	604.685-026
Milling Machine Operator	605.685-030
Small Engine Mechanic	625.281-034
Surface-Grinder Operator	603.685-062

SECONDARY PROGRAM: Machine Shop

CIP CODE: 48.0503

SECONDARY COURSES: Machine Shop I (8539)
Machine Shop II (8540)
Machine Shop III (8541)

POSTSECONDARY PROGRAM (VCCS): Mechanical Engineering Technology (MECH)

OCCUPATIONAL TITLE	DOT NUMBER
Automotive Machinist	600.280-034
Job Setter	600.380-014
Machine Operator I	616.360-018
Machine Operator II	619.685-062
Machine Set-Up Operator	600.380-018
Machinist	600.280-022
Machinist Apprentice	600.280-026
Maintenance Machinist	600.280-042
Maintenance Mechanic	638.281-014
Tool-Machine Set-Up Operator	601.280-054

SECONDARY PROGRAM: Maintenance and Repair

CIP CODE: 47.0301

SECONDARY COURSES:
Maintenance and Repair I (8542)
Maintenance and Repair II (8543)
Maintenance and Repair III (8544)

POSTSECONDARY PROGRAM (VCCS):
Air Conditioning and Refrigeration (AIRC); Appliance Servicing (APPL); Industrial Engineering Technology (INDT); Mechanical Engineering Technology (MECH)

OCCUPATIONAL TITLE	DOT NUMBER
Air Conditioning and Heating Mechanic	637.261-014
Air Conditioning Mechanic Helper	637.664-010
Electric Motor Repairer	721.281-018
Electrical-Appliance Repairer	723.381-010
Electrician, Machine Shop	829.281-014
Plumber, Maintenance	862.381-030
Small Engine Mechanic	625.281-034

SECONDARY PROGRAM: Masonry

CIP CODE: 46.0102

SECONDARY COURSES: Masonry I (8512)
Masonry II (8513)
Masonry III (8514)

POSTSECONDARY PROGRAM (VCCS): Building (BLDG)

OCCUPATIONAL TITLE	DOT NUMBER
Bricklayer Apprentice	861.381-022
Bricklayer, Construction	861.381-018
Bricklayer Helper	869.687-026
Contractor	182.167-010
Form Builder	860.381-046

SECONDARY PROGRAM: Metal Trades

CIP CODE: 48.0599

SECONDARY COURSES: Metal Trades I (8548)
Metal Trades II (8549)
Metal Trades III (8550)

POSTSECONDARY PROGRAM (VCCS): Sheet Metal (SMTL)

OCCUPATIONAL TITLE	DOT NUMBER
Drill Press Operator	606.682-014
Grinder Operator, Production	603.685-062
Heat Forger	619.282-022
Layout Worker (Machine Shop)	600.281-018
Metal Fabricator	619.360-014
Metal Fabricator Apprentice	619.360-018
Metal Lather	842.361-010
Metal Lather Apprentice	842.361-014
Metal Sheet Operator II	615.685-034
Milling Machine Operator	605.685-030
Production Line Welder	819.684-010
Tool-Machine Set-Up Operator	601.280-054

SECONDARY PROGRAM: Mine Machinery Repair

CIP CODE: 47.0304

SECONDARY COURSES: Mine Machinery Repair I (8580)
Mine Machinery Repair II (8581)
Mine Machinery Repair III (8582)

POSTSECONDARY PROGRAM (VCCS): Mining (MINE)

OCCUPATIONAL TITLE	DOT NUMBER
Combination Welder	819.384-010
Electrician	824.261-010
Maintenance Mechanic	638.281-014

SECONDARY PROGRAM: Plumbing

CIP CODE: 46.0503

SECONDARY COURSES: Plumbing I (8551)
Plumbing II (8552)
Plumbing III (8553)

POSTSECONDARY PROGRAM (VCCS): Building (BLDG)

OCCUPATIONAL TITLE	DOT NUMBER
Pipe Fitter	862.381-018
Pipe Fitter Apprentice	862.381-026
Pipe Fitter Helper	862.381-022
Pipe Installer	869.381-018
Plumber (Construction)	862.381-030
Plumber (Manufactured Buildings)	862.681-010
Plumber Apprentice	862.381-034

SECONDARY PROGRAM: Power Mechanics

CIP CODE: 47.0499

SECONDARY COURSES: Power Mechanics I (8554)
Power Mechanics II (8555)
Power Mechanics III (8556)

POSTSECONDARY PROGRAM (VCCS): Mechanical Engineering Technology (MECH)

OCCUPATIONAL TITLE	DOT NUMBER
Diesel Mechanic	625.281-010
Diesel Mechanic Apprentice	625.281-014
Pneumatic Tool Repairer	630.281-010
Power Saw Mechanic	625.281-030
Pump Servicer	630.281-018
Small Engine Mechanic	625.281-034

SECONDARY PROGRAM: Printing

CIP CODE: 48.0201

SECONDARY COURSES: Printing I (8660)
Printing II (8661)
Printing III (8662)

POSTSECONDARY PROGRAM (VCCS): Printing (PRIN)

OCCUPATIONAL TITLE	DOT NUMBER
Bindery Worker	653.685-010
Lithographic Photographer	972.382-010
Lithographic Stripper	972.381-022
Offset Press Operator	651.482-010
Paste-Up Copy Camera Operator	979.381-018
Phototypesetter Operator	650.582-022
Print Shop Helper	979.684-026
Printer	651.380-010

SECONDARY PROGRAM: Radio and Television Communications

CIP CODE: 47.0103

SECONDARY COURSES:

Radio Communications I (8640)	Television Communications I (8622)
Radio Communications II (8641)	Television Communications II (8623)
Radio Communications III (8642)	Television Communications III (8624)

POSTSECONDARY PROGRAM (VCCS):

Radio and Television (RDTV); Speech and Drama (SPDR); Technical Theater (THEA)

OCCUPATIONAL TITLE	DOT NUMBER
Announcer	159.147-010
Audio Operator	194.262-010
Audiovisual Production Specialist	149.061-010
Dubbing Machine Operator	962.665-010
Film Editor	962.264-010
Grip	962.684-014
Program Assistant	962.167-014
Sound Controller	194.262-014
Sound Mixer	194.262-018
Technical Director	962.162-010
Telecine Operator	194.362-010
Television Schedule Coordinator	199.387-010
Video Operator	194.282-010

SECONDARY PROGRAM: Radio and Television Repair

CIP CODE: 47.0199

SECONDARY COURSES: Radio and TV Repair I (8619)
Radio and TV Repair II (8620)
Radio and TV Repair III (8621)

POSTSECONDARY PROGRAM (VCCS): Radio and Television (RDTV)

OCCUPATIONAL TITLE	DOT NUMBER
Antenna Installer	823.684-010
Audio-Video Repairer	729.281-010
Public Address Servicer	823.261-010
Radio Repairer	720.281-010
Sound Technician	829.281-022
Tape Recorder Repairer	720.281-014
Television Installer	823.361-010
Television and Radio Repairer	720.281-018
Television Receiver Analyzer	726.281-014

SECONDARY PROGRAM: Sheet Metal

CIP CODE: 48.0506

SECONDARY COURSES: Sheet Metal I (8663)
Sheet Metal II (8664)
Sheet Metal III (8665)

POSTSECONDARY PROGRAM (VCCS): Sheet Metal (SMTL)

OCCUPATIONAL TITLE	DOT NUMBER
Sheet Metal Fabrication Machine Operator	616.360-018
Sheet Metal Layout Worker	809.281-010
Sheet Metal Production Worker	619.685-062
Sheet Metal Shop Helper	619.686-022
Sheet Metal Worker	804.281-010
Sheet Metal Worker Apprentice	804.281-014

SECONDARY PROGRAM: Small Engine Repair

CIP CODE: 47.0606

SECONDARY COURSES: Small Engine Repair I (8725)
Small Engine Repair II (8726)
Small Engine Repair III (8727)

POSTSECONDARY PROGRAM (VCCS): None identified

OCCUPATIONAL TITLE	DOT NUMBER
Gas Engine Repairer	625.281-026
Motorcycle Repairer	620.281-054
Outboard Motor Mechanic	623.281-042
Outboard Motor Tester	623.261-014
Power Saw Mechanic	625.281-030
Small Engine Mechanic	625.281-034

SECONDARY PROGRAM: Tailoring

CIP CODE: 20.0305

SECONDARY COURSES: Tailoring I (8669)
Tailoring II (8670)
Tailoring III (8671)

POSTSECONDARY PROGRAM (VCCS): None identified

OCCUPATIONAL TITLE	DOT NUMBER
Alteration Tailor	785.261-010
Alterer Apprentice	785.261-018
Custom Tailor	785.261-014
Custom Tailor Apprentice	785.261-022
Dressmaker	785.361-010
Garment Fitter	785.361-014
Hand Sewer	782.684-058
Patternmaker	781.381-026
Sewing Machine Operator, Garments	787.682-046

SECONDARY PROGRAM: Upholstering

CIP CODE: 48.0303

SECONDARY COURSES: Upholstery I (8585)
Upholstery II (8586)
Upholstery III (8687)

POSTSECONDARY PROGRAM (VCCS):

Furniture (FURN); Textile Management (TEXT);
Interior Design (INDG)

OCCUPATIONAL TITLE	DOT NUMBER
Chair Upholsterer	780.684-034
Furniture Upholsterer	780.381-018
Upholsterer, Inside	780.684-046
Upholsterer, Outside	780.684-118
Upholstery Cutter, Machine	781.684-014
Upholstery Repairer	780.684-122
Upholstery Trimmer	780.684-126

SECONDARY PROGRAM: Welding

CIP CODE: 48.0508

SECONDARY COURSES: Welding I (8672)
Welding II (8673)
Welding III (8674)

POSTSECONDARY PROGRAM (VCCS): Welding (WELD)

OCCUPATIONAL TITLE	DOT NUMBER
Arc Cutter	816.364-010
Arc Welder	810.384-014
Brazer Assembler	813.684-010
Combination Welder	819.384-010
Gas Welder	811.684-010
Handthermal Cutter I	816.464-010
Handthermal Cutter II	816.684-010
Production Line Worker	819.684-010
Tack Welder	810.684-010
Welder Helper	819.687-014

SECTION II.

STUDENT ORGANIZATIONS

Each vocational student organization provides opportunities for students to (1) exhibit pride in work; (2) demonstrate competencies related to the world of work; and (3) develop leadership abilities, responsible citizenship, and a realistic self-image. These goals are achieved through activities structured within each vocational program and course. Vocational student organizations provide a means through which students become involved in school and community activities, carry out individual or group projects related to career life goals, and meet with community leaders and employers in a variety of situations. The knowledge, skills, and attitudes developed through these organizations facilitate the students' transition from school to their chosen vocation and to responsible adulthood.

The Vocational Education Amendments of 1976, P.L. 94-482, place emphasis on ensuring that curriculum development activities will have an impact on instruction in vocational education classrooms. Each vocational service has an appropriate vocational student organization operating as an integral part of the instructional program.

On June 23, 1978, the Virginia State Board of Education approved the following policy standards for operation of vocational education programs:

> A local chapter of the appropriate vocational student organization is operating as an integral part of each vocational program field in the school.
>
> Vocational teachers are serving as advisors to the local chapter or a section of the vocational student organization.
>
> Participation of students in chapter instructional activities is required regardless of whether they are paid members of the organization.

STUDENT ORGANIZATIONS

Competency Development

Through

Vocational Industrial Clubs of America (VICA)

I. Description of Organization

What is Virginia VICA? The Virginia Association of the Vocational Industrial Clubs of America (VICA) is a vocational organization for students enrolled in trade, industrial, technical, and health occupations courses. Over 250,000 students belong to the national organization. Virginia VICA is the fourth largest state association, with more than 15,000 members.

The Purpose of Virginia VICA. Virginia VICA offers leadership, citizenship, and character development programs and activities to complement skill training available in the public schools and community colleges. Its programs help students better prepare themselves for the labor market. Virginia VICA emphasizes respect for the dignity of work, high standards in trade ethics, work quality, scholarship, and safety. It promotes understanding of the free enterprise system and encourages development of patriotism through the practice of democracy in the club.

How It Works. Students are motivated to learn and excel through opportunities to acquire leadership experience and an understanding of the democratic process; to work together to improve school and community; and to receive individual recognition for both skill and leadership achievement.

II. Opportunities for Class/VICA Coordination

A. Leadership Development Activities

Becoming a professional contains factors other than acquiring a skill. It also involves an increased awareness of the meaning of good citizenship and the importance of labor and management in the world of work. Listed below are several examples of leadership and professional development activities:

1. Plan a school assembly on vocational education and VICA.

2. Host a reception for VICA alumni; have them tell how VICA has helped them in their work experiences.

3. Establish an occupational or professional library.

4. Attend a court session or a local government public meeting.

5. Take a trip to a union hall, a local business, another VICA club, or the state legislature.

6. Invite guest speakers from labor and management organizations.

7. Sponsor a Job Fair.

8. Hold a workshop on parliamentary procedures, public speaking, or job interviews.

9. Sponsor a debate.

10. Provide training for entries in Skill Olympics leadership contests.

B. Field/Community Resources for Instruction

Using the resources available in the community can add an extra dimension to classroom instruction. Identified below are several groups who can share their expertise with students:

1. General and craft advisory committees

2. Former students

3. Professional trade organizations

4. District and State VICA Officers

5. Virginia Department of Education personnel.

C. School/Community Service Activities

Letting people know that VICA and its advisors are there and care about the community promotes understanding and goodwill. Several examples of school/community service activities are presented below:

1. Invite members of a civic organization to a dinner; join them in a service project.

2. Entertain at an orphanage, hospital, nursing home, jail, or mental institution.

3. "Adopt" a needy family for Thanksgiving; prepare a food basket for them.

4. Work to "get out the vote" at election time.

5. Hold a voter awareness seminar for students of voting age.

6. Plan and carry out a beautification/conservation/renovation project.

7. Collect toys for holiday distribution to needy children.

8. Plan a consumer education program.

9. Plan an assembly on vocational education and VICA.

10. Use National VICA Week to tell the VICA story in the school and community.

D. Fund-Raising or Enterprise Activities

Planning and participating in fund-raising activities provide the financial means to carry out other projects. Policies and procedures of the local school division, as well as community restrictions or guidelines, govern the type of enterprising activities that any school organization may undertake. The advisor and members should ensure that activities undertaken are of a constructive nature.

E. Activities for Recognition

1. Competitive

Virginia VICA conducts contests on the local, district, and state levels in which students demonstrate the occupational and leadership skills they are learning. The annual Virginia VICA Skill Olympics is the state-level competition, in which 2,000 students compete in 59 occupational and leadership skill areas. First-place state winners represent the Commonwealth at the Annual United States Skill Olympics.

2. Non-Competitive

The Vocational Initiative and Club Achievement Program recognizes the individual student for progress in occupational and leadership development. Students attain different degrees as they progress both in personal growth and in knowledge of their chosen fields of work. The program is designed as a self-paced instructional aid to the classroom activities.

III. Other Programs, Publications, and Applications of VICA to Competency-Based Education

A. Resource Materials

The VICA advisor should become familiar with certain basic VICA resource materials that will serve as aids in the classroom, including the following:

1. Virginia VICA Advisor's Manual
2. Leadership Handbook, Revised, Vocational Industrial Clubs of America
3. Directions, A Guide for VICA Club Advisors
4. Virginia VICA State Level Contests
5. VICA U.S. Skill Olympics Regulations
6. Achievement Program Guide
7. Parliamentary Procedure at a Glance, by O. Garfield Jones.

B. Audiovisual Aids

Virginia VICA also has two films and a slide presentation available to VICA chapters on a first-request basis:

1. VICA: Going Places -- 15-minute color/sound 16mm film with original theme music; tells all about VICA for students, community, labor, and management groups.
2. You're Number One -- 5-1/2 minute color/sound 16mm film with music and narration; serves as a motivational film.
3. Achievement Program Slide Kit -- color slides and a script to introduce the program and explain how it works.

Information on ordering the resource materials is available from the Virginia VICA Association, P.O. Box 6Q, Richmond, Virginia 23216, (804) 225-2932.

SKILL OLYMPICS

Skill Olympics competitions, sponsored by VICA on the district, state, and national levels, exist for the primary purpose of recognizing vocational student excellence in achievement in the areas of leadership development and occupational skill area. The Skill Olympics program is a means of integrating VICA activities into the classroom.

Following are some of the benefits of participation in the Skill Olympics:

Provides a link between student and community

Provides a link between student and industry as potential employer

Promotes interest and provides incentive to excel in the classroom

Helps develop pride in work quality

Aids vocational educators in identifying new technologies, industry needs, and emerging occupations

Prepares students for world of work through interaction with workers in the field.

The U.S. Skill Olympics program sponsors competitions in the areas of Leadership Development; Health Occupations; Trade, Industrial, and Technical Occupations; and General Contests. There are contests designed for club awards as well as individual competition. District contest winners may advance to the state level, and state winners to the national level; however, some competitions may be held only at the district or state level. National contests are as following:

Leadership Development Contests

Club Business Procedure
Extemporaneous Speaking
Job Interview
Opening and Closing Ceremonies
Prepared Speech

Health Occupations Contests

Dental Assisting
Dental Laboratory Technology
Medical Assisting
Medical Laboratory Technology
Nurse Assisting
Practical Nursing

Trade, Industrial, and Technical Occupations Contests

Air Conditioning and Refrigeration
Air-Cooled Gasoline Engine Repair

Architectural Drafting
Auto Body Repair
Auto Mechanics
Bricklaying
Cabinetmaking and Millwork
Carpentry
Commercial Art
Commercial Food Trades
Commercial Photography
Cosmetology
Diesel Equipment Mechanics
Electrical Trades
Electronic Products Servicing
Graphic Communications
Industrial Electronics
Machine Drafting
Major Appliance Repair
Plumbing and Pipefitting
Precision Machining (Machine Tool Technology)
Sheet Metal
Welding

General Contests

Display
Job Skill Demonstration
Outstanding Club
Safety

Further information on the organization and regulations for the U.S. Skill Olympics may be obtained from Vocational Industrial Clubs of America, Inc., P.O. Box 3000, Leesburg, Virginia 22075.

Further information on the organization and regulations for state Skill Olympics may be obtained from the Supervisor of Trade and Industrial Education, Virginia Department of Education, P.O. Box 6Q, Richmond, Virginia 23216.

The Virginia VICA Skill Olympics program offers competitions in addition to those held on the national level. The VICA advisor should be familiar with the regulations on the state level to ensure knowledge of any exception to the national regulations.

The following contests are sponsored by the Virginia VICA State Association:

Leadership Development Contests

Current Events
Essay
Student of the Year

Trade, Industrial, and Technical Occupations Contests

Auto Servicing
Building Maintenance
Building Trades
Commercial Sewing
Industrial Maintenance Mechanic
Mine Maintenance Repair
Needle Trades
Radio Communications
Technical Illustration

General Contests

Bulletin Board
Club Scrapbook
Occupational Display
Occupational Scrapbook
Poster
Spelling
Talent

Extemporaneous Speaking

Purpose
To evaluate each contestant's ability to give a speech on an assigned topic with a minimum of advance preparation

First, refer to General Regulations.

Clothing Requirement
VICA blazer (#310-#317) and accompanying official dress

Eligibility
Open to active VICA members

Observer Rule
Observers will be allowed to hear the speeches in the presentation room provided space is available. No talking or gesturing will be permitted. No observers will be allowed in the assembly room. No member of the audience will be permitted to enter or leave the presentation room while a contestant is speaking.

Scope of the Contest
1. Contestants will draw numbers during the pre-contest orientation meeting to determine the order of competition.
2. The technical committee will select a speech topic based upon material in the VICA *Leadership Handbook*. All contestants will be assigned the same topic.
3. One at a time, contestants will enter the preparation room where they will be given the speech topic. Contestants will have five minutes to determine the content and organize their speeches.
4. During preparation time, contestants may consult reference material supplied in the preparation room and may make notes on 3" x 5" cards for use during the speech. Contestants may *not* take any outlines, notes, or reference materials into the preparation room.
5. The speech shall be at least three minutes in length but shall not exceed five minutes. *Penalty:* Five points will be deducted for each 30 seconds or fraction thereof under three minutes or for each 30 seconds or fraction thereof over five minutes.
6. Time limit—Time will be started when the speech begins. The timekeeper will signal the speaker at three minutes, four minutes, and five minutes. Contestants will be permitted to use a watch or clock.
7. No contestant will mention her or his name, school, city or state.

Arrangement of Rooms
1. Assembly room—An area in which contestants will wait their turns to enter the preparation room will be provided.
2. Preparation room—A room furnished with a table or desk and chair will be provided for the five-minute preparation time. All necessary reference materials and blank 3" x 5" cards will be available in this room.
3. Speech presentation room—This room will be furnished with a speaker's stand (lectern) facing the audience and judges.

Equipment and Materials
1. Supplied by the technical committee:
   a. Reference materials: VICA *Leadership Handbook; Webster's New Collegiate Dictionary; Bartlett's Familiar Quotations; Roget's Thesaurus*
   b. Blank 3" x 5" cards
   c. Copies of selected speech topic in sealed envelopes
   d. Stopwatch
   e. Time cards
   f. All necessary information and furnishings for judges and technical committee
2. Supplied by the contestant:
   a. Pencil or pen

SAMPLE ONLY

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VICA U.S. SKILL OLYMPICS
EXTEMPORANEOUS SPEAKING
Rating Sheet

ITEMS EVALUATED	Excellent	Very Good	Good	Fair	Poor	CONTESTANT NUMBER
Opening *Appearance* *Introduction*	10	8	6	4	2	
Voice *Pitch* *Tempo* *Volume* *Enthusiasm*	10	8	6	4	2	
Platform Deportment *Gestures* *Poise* *Eye-contact* *Mannerisms*	10	8	6	4	2	
Organization *Logic* *Clarity* *Suitability* *Coherence*	20	16	12	8	4	
Mechanics *Diction* *Grammar* *Pronunciation* *Word Picture*	10	8	6	4	2	
Close *Summary* *Conclusion*	10	8	6	4	2	
Effectiveness (assigned topic covered)	30	24	18	12	6	
TIME PENALTY (minus 5 pts. for each fraction of 30 sec. under 3 min. or for each fraction of 30 sec. over 5 min.)						
CLOTHING PENALTY (minus 10% of total possible points)						
TOTAL POINTS	100	80	60	40	20	

SAMPLE ONLY

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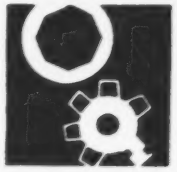
Auto Mechanics



Purpose

To evaluate each contestant's mastery of entry-level job skills and to recognize outstanding students for excellence and professionalism in the field of auto mechanics

First, refer to General Regulations

Clothing Requirement

White work pants (#240), white work shirt (#230), regular work shoes, safety glasses

Eligibility

Open to active VICA members enrolled in vocational programs with auto mechanics as the occupational objective

Scope of the Contest

1. Contestants will be rotated through various contest areas as identified below:
   a. Engine
   b. Power train
   c. Brakes
   d. Electrical and fuel systems
   e. Live car systems
   f. Written test (administered by the National Institute for Automotive Service Excellence)
2. Contestants will be judged on their ability to perform jobs or skills which may include, but are not limited to, the following:
   a. Engine
      1) Refacing of valve and valve stem
      2) Cutting of two valve seats on cylinder head (intake and exhaust)
      3) Setting up of timing gear and timing chain to factory specifications as outlined in manufacturer's repair manual for a particular motor
      4) Removal and replacement of piston and rebabbiting of connecting rod
      5) Measuring of cam and crankshaft to nearest thousandths
      6) General servicing of automotive diesel engines
   b. Power train
      1) Setting up and checking of backlash on differential ring and pinion assembly
      2) Assembly of transmission clutch pack
      3) Removal and replacement of universal joint
   c. Brakes
      1) Disassembly of front brake assembly
      2) Disassembly of wheel cylinder
      3) Reassembly of both units and adjusting of brake shoes
      4) Reassembly of master cylinder
   d. Electrical and fuel systems
      1) Setting of dwell on points
      2) Setting of timing
      3) Assembly and disassembly of carburetor
      4) Testing of a disassembled generator
         a) Armature
         b) Field coil
         c) Brush holder
      5) Testing of alternator
      6) Testing of electronic ignition system
   e. Live car systems
      1) Cylinder location
      2) Vacuum measurements
      3) Secondary wire tests
      4) Belt tensions
      5) Cooling system check
      6) Compression check
      7) Emissions check
      8) Safety equipment check
      9) Basic testing of automotive diesel engines
3. Contestants will be tested on American-made automobiles.
4. Contestants will be judged on accuracy, workmanship, and speed.

Equipment and Materials

1. Supplied by the technical committee:
   a. All necessary tools and equipment for the contest
   b. All necessary information and furnishings for judges and technical committee

SAMPLE ONLY

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VICA U.S. SKILL OLYMPICS
AUTO MECHANICS
Rating Sheet
(Sample Only)

ITEMS EVALUATED—Each contest will be different		POSSIBLE POINTS	CONTESTANT NUMBER
Operation 1.	**Head Conditioning**		
	Guide clearance	10	
	Seat resurface	10	
	Valve resurface	10	
	Clean valve guide	10	
	Assembly	10	
	Spring free height	10	
	Workmanship	10	
	Speed	5	
	Safety practices	10	
Operation 2 Total 8-15 operations These are samples only—Rating Sheet must be developed for specific contest	**Transmission**		
	Identify synchro parts	10	
	Assemble synchro	10	
	Remove clutch plates	10	
	Remove piston & springs	10	
	Check oil delivery hole	5	
	Lube, seal and install piston & springs	10	
	Measure clutch pack clearance	5	
	Workmanship	10	
	Speed	5	
	Safety practices	10	
SUB-TOTAL—All Operations			
CLOTHING PENALTY (minus 10% of total possible points)			
TOTAL POINTS			

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VICA STATE SKILL OLYMPICS

ESSAY CONTEST

PURPOSE

To evaluate each contestant's ability to prepare and present a paper on an assigned topic.

SCOPE OF THE CONTEST (RULES)

1. The title of the essay will be the annual theme announced by National VICA.

2. There shall be a minimum of 500 words and a maximum of 1,000 words in the body of the essay.

* 3. The essay must be typed and double-spaced on only one side of 8½" x 11" paper.

4. The name and school of the District winner shall be omitted from the body of the essay.

SAMPLE ONLY

* Failure to comply with this requirement will result in a 10 point penalty.

ESSAY CONTEST

I. ORGANIZATION (60 POINTS)	POINT VALUE	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL
a. Sentences and paragraph structure													
b. Punctuation													
c. Spelling													
d. Neatness													

SAMPLE ONLY

II. STYLE (30 POINTS)													
a. Quality of essay 1. Completeness 2. Flow													

AUTO SERVICING

PURPOSE

To evaluate each contestant's mastery of entry-level job skills and to recognize outstanding students for excellence and professionalism in the field of auto servicing.

SCOPE OF THE CONTEST (RULES)

1. The contest will consist of judging the contestant's performance in five or more of the following areas:

   A. Shop safety
   B. Tool identification
   C. Vital fluid and oil checks
   D. Battery
   E. Wheel, tire
   F. Cooling system
   G. Lubricating system
   H. Fuel system
   I. Exhaust system
   J. Air condition
   K. Brake system
   L. Air cleaner
   M. Transmission
      1. Manual
      2. Automatic
   N. Chassis

2. Contestants will be judged according to the following items:

   A. Accuracy - as compared to factory specifications.

   B. Workmanship - proper use of tools and equipment and safety practices.

   C. Speed - judged according to time normally required in industry.

EQUIPMENT AND MATERIALS

Contestant must supply the proper eye protective equipment.

SAMPLE ONLY

AUTO SERVICING

RATING SHEET

OPERATION	POINT VALUE	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL
1	Speed 0-10												
	Accuracy 0-10												
	Workmanship 0-10												
2	Speed 0-10												
	Accuracy 0-10												
	Workmanship 0-10												
3	Speed 0-10												
	Accuracy 0-10												
	Workmanship 0-10												
4	Speed 0-10												
	Accuracy 0-10												
	Workmanship 0-10												
5	Speed 0-10												
	Accuracy 0-10												
	Workmanship 0-10												
TOTAL POINTS (150 possible)													

SAMPLE ONLY

SECTION III.

CLASSROOM MANAGEMENT SYSTEMS

Vocational programs and courses, particularly those in Trade and Industrial Education, contain a large number of competencies and related learning experiences to be mastered by students over a relatively short period of time. A variety of instructional methods and materials may be used to prepare students for entry into an occupation or to teach the basics for continuing education. Therefore, a systematic approach to the management of instruction is required, especially in competency-based vocational programs.

The following questions must be considered when establishing management procedures for competency-based instruction:

1. How and when will students be informed of course or unit objectives and requirements?
2. How will content and instructional activities be sequenced in the course?
3. Will students learn in an independent or group setting?
4. Will a variety of instructional methods and strategies be used?
5. How will laboratory and lecture activities be integrated?
6. How will slow and fast learners be accommodated?
7. How will VICA activities be integrated into instruction?
8. How will students be evaluated and when will the testing occur (pretest, unit tests, as a competency is demonstrated)?
9. How and when will student achievement be documented on the competency record?
10. How will recorded competency achievements be made available to future employers?
11. How will students who transfer from another school or program be placed at an appropriate level in the program?

The purpose of this section is to illustrate samples of several classroom management systems developed by teachers incorporating competency-based vocational education techniques into their courses and programs. The systems have been field tested and revised for use in laboratories and classrooms in Virginia.

The following classroom management systems are discussed in this section:

Lesson Plans
Student Task Sheets
Learning Contracts
Self-Contained Learning Systems
Task Board Management System

It is important to note that any combination of the above systems may be used by the individual classroom teacher in actual delivery of instruction.

LESSON PLANS

Competency-based education requires that instructional content within vocational education courses be based upon predetermined competencies and objectives. Ensuring the actual achievement of intended course outcomes requires a very high degree of organization in daily planning for instruction. The lesson plan is a most effective tool for organizing and implementing instruction within each class session.

The lesson plan may be viewed as a detailed part of a blueprint for the total course. It assures (1) that the instructional content for each class session is related to overall course objectives, and (2) that content across class sessions is sufficiently inclusive and sequenced so that predetermined course outcomes are, in fact, achieved. Additionally, it assures effective use of instructional activities and materials in delivering the instructional content of each class session.

Lesson plan format may vary according to instructor preference or local requirements. The format of the sample corresponds to that of the task/competency frameworks included in the task analyses package developed for many trade and industrial courses (Figure 1) and incorporates job sheets, transparency masters, and tests from Mid-America.

The listing which follows describes the components of the sample lesson plan (Figure 2). Where appropriate, the component is cross-referenced to the corresponding section(s) of the sample framework. Referral to that section in an actual task analyses package can provide the teacher with useful information in developing the lesson plan component.

A blank lesson plan form is also included in this section.

Lesson Plan Components

LESSON TITLE--a brief phrase summarizing the content of the lesson; primarily serves as aid to instructor in readily locating a needed plan.

COURSE--may include more than one listing in cases where a given task/competency is identified for inclusion in several courses. (Figure 1, #4)

INSTRUCTIONAL UNIT--a distinct grouping of related task competencies; Duty Area may be listed here. (Figure 1, #1)

TASK/COMPETENCY--the knowledge, skills, or attitudes which the learner should possess after the lesson plan is implemented. (Figure 1, #2)

PERFORMANCE OBJECTIVE--a statement of the behavior or performance to be exhibited by the student after instruction, the condition under which the behavior takes place, and the criterion level or standard which the student must meet for task mastery. (Figure 1, #5)

TOOLS/MATERIALS--a listing of any tools, equipment, or supplies that will have to be secured or developed by the instructor in implementing lesson plan activities. (Figure 1, #9)

AUDIOVISUAL MATERIALS--a listing of any nonprint materials used in lesson plan activities. (Figure 1, #10)

REFERENCES--a listing of any printed materials to be used by students in lesson plan activities; may also include resources that are helpful to the instructor in implementing the lesson, but not intended for direct student use. (Figure 1, #11)

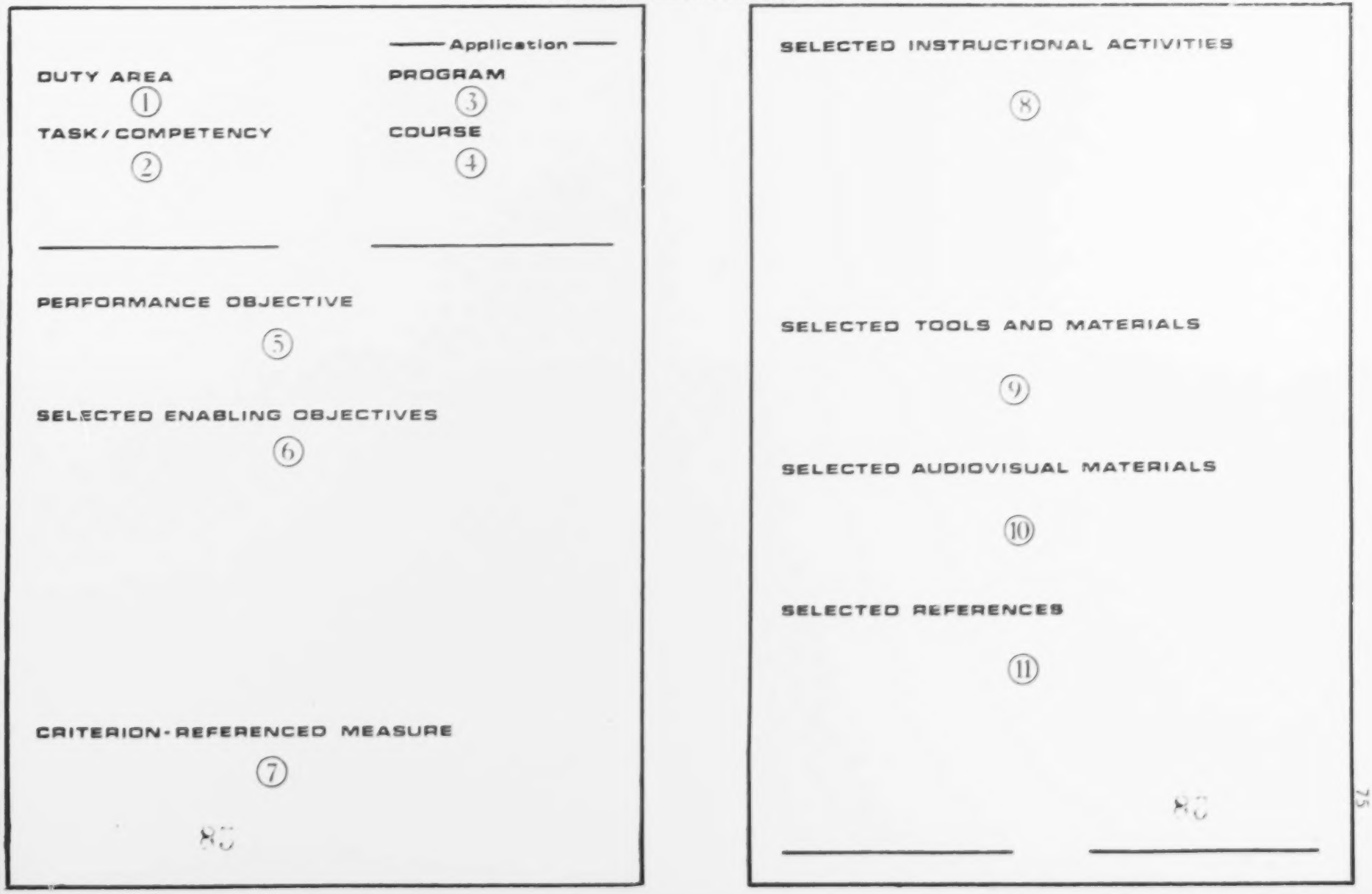
STUDENT ASSIGNMENTS--identification of activities the student will complete to reinforce or apply instruction. (Figure 1, #6 & 8)

PRESENTATION--a description of all lesson plan activities, listed in sequence and grouped according to the following types and purposes: (Figure 1, #7 & 8)

- Introduction--to orient, to motivate, to provide continuity
- Presentation--to bring student face to face with the new concept, habit, or skill; to show; to explain; to demonstrate; to relate to learner experience
- Discussion--to clarify, to expand; to reinforce, to correct; to allow learner to verbalize, question, respond, and provide evidence of concept understanding
- Application--to apply, use, or verify concept; to build motor skills; to build habit; to develop attitudes through experiences
- Evaluation--to provide periodic closure; to modify concept; to expand divergent thinking; to summarize; to test.

Figure 1

TASK ANALYSES FRAMEWORK



CRITERION-REFERENCED MEASURE--identification of the means of student evaluation and the minimum standard of performance accepted for mastery; should correspond with performance objective. (Figure 1, #7)

SPECIAL NOTES--for instructor's notations concerning evaluation of the plan after it is implemented; may contain suggestions for future use of the plan.

Figure 2

SAMPLE LESSON PLAN--Side 1

LESSON PLAN

by

_____

Service and Replace Batteries and Battery Parts
Lesson Title

④ Auto Mechanics I (8506)
Course

① Servicing Batteries
Instructional Unit

② TASK/COMPETENCY: (knowledge, skills, or attitudes student gains from instruction)

Service or replace batteries, cables, and battery box (Mid-America Objectives 9a and 9b)

⑤ PERFORMANCE OBJECTIVE: (expected conditions, performance, and criterion or standard)

Given a vehicle in need of battery service and the necessary tools and equipment, service the battery, battery box, and cables and determine the battery state of charge and condition. All malfunctions identified by the instructor must be recognized and serviced, and the state of charge and serviceability must be identified accurately.

⑨TOOLS/MATERIALS:

Basic handtool set
Battery charger
Battery filler
Hydrometer or refractometer
Baking soda & container
Voltmeter
Battery components
Job sheets
Info sheets

⑩AUDIOVISUAL MATERIALS:

Transparency master, AMII-65B
Also see Automotive Mechanics and Servicing Instructional Resource Guide, page 149.

⑪ REFERENCES:

Automotive Mechanics, Vol. II, pp. 57B-81B. Mid-America.
Automotive Mechanics and Servicing Instructional Resource Guide, pp. 148-149.

⑥ STUDENT ASSIGNMENT(S):
⑧

Complete activities outlined on Student Task Sheet.

Figure 2

SAMPLE LESSON PLAN--Side 2

PRESENTATION: (Introduction, presentation, discussion, application, & evaluation)
⑤⑧

I. Introduction
   A. Safety procedures
   B. Purpose of batteries
   C. Parts of battery

II. Presentation
   A. AVs
   B. Transparency from Mid-America
   C. Demonstrations
      1. Activation of dry-charged battery
      2. Leakage across top of battery
      3. Cell-to-cell voltage test
      4. Battery removal, clamp and post cleaning, use of baking soda solution

III. Discussion
   A. Causes of battery failure
   B. Chemical action in battery during charging and discharging
   C. Temperature effects on battery performance
   D. Load-testing and use of battery charger

IV. Application
   A. Student servicing of battery, cables, and battery box, using Job Sheet #1
   B. Student removal and replacement of battery, using Job Sheet #2

V. Evaluation
   A. Results of activities on Job Sheets #1 and 2
   B. Performance of this part of Battery Service Test (AM-II, 89B-92B)
   C. Performance of task as related to CRM (below)

CRITERION REFERENCED MEASURE: ⑦

Service the battery, battery box, and cables and determine battery condition and state of charge. All malfunctions identified by the instructor must be recognized and serviced, and the state of charge and serviceability must be identified accurately.

SPECIAL NOTES: (Resource persons, if any; results and follow-up)

LESSON PLAN

by

_____

_____

Lesson Title

_____ _____

Course Instructional Unit

TASK/COMPETENCY: (knowledge, skills, or attitudes student gains from instruction)	
PERFORMANCE OBJECTIVE: (expected conditions, performance, and criterion or standard)	
TOOLS/MATERIALS:	AUDIOVISUAL MATERIALS:
REFERENCES:	
STUDENT ASSIGNMENT(S):	

PRESENTATION: (Introduction, presentation, discussion, application, & evaluation)

CRITERION REFERENCED MEASURE:

SPECIAL NOTES: (Resource persons, if any; results and follow-up)

STUDENT TASK SHEETS

The student task sheet is primarily intended for use as a handout and may include the following components, as displayed in the sample provided:

- The task/competency statement
- The performance objective developed to correspond to the task/competency
- The enabling objectives, or subtasks leading to mastery of the overall objective
- The planned learning activity(ies) corresponding to each enabling objective
- A statement of the criterion-referenced measure for the identified task/competency
- Any necessary directions for completing one or more learning activities or tasks
- A section for evaluation of the completed task(s) for recordkeeping and feedback purposes.

As a classroom management tool, the student task sheet may provide the following benefits to both the instructor and the student in competency-based education:

- Once task/competencies for a given course have been identified, the instructor may use the student task sheet as a planning form, ensuring that each task is included and adequately planned for in instruction.
- In a group instruction setting, distribution of the completed student task sheet prior to instruction informs the student of upcoming instructional plans and requirements.
- In an individual instruction setting, the teacher can complete all but the learning activities section of the form and allow the student to help select or design learning activities that are both challenging and meaningful.
- The "task instruction" section of the form can be used to give the student any helpful information about the lesson or detailed directions for completing a learning activity or hands-on task.
- The recording of dates and evaluation comments renders the sheet a documentation device for the teacher or a means of feedback for the student.

STUDENT TASK SHEET

TASK/COMPETENCY: Service or replace batteries, cables, and battery box

PERFORMANCE OBJECTIVE: Given a vehicle in need of battery service and the necessary tools and equipment, service the battery, battery box, and cables and determine the battery state of charge and condition. All malfunctions identified by the instructor must be recognized and serviced, and the state of charge and serviceability must be identified accurately.

ENABLING OBJECTIVES:	LEARNING ACTIVITIES:	COMPLETED:
1. Describe safety precautions involved in servicing batteries.	1. List in writing safety hazards involved in handling acid, charging, and jump starting.	
2. Identify parts of battery.	2. Observe transparency on battery construction; label diagram of battery.	
3. Relate temperature to battery performance.	3. Listen to lecture.	
4. Explain causes of battery failure.	4. Observe film; participate in class discussion.	
5. Explain chemical action in battery during charging and discharging.	5. Observe film and transparency; read Mid-America information sheets.	
6. Check electrolyte level.	6. Follow Job Sheet #3 if necessary.	
7. Load test battery and use battery charger.	7. Review procedure; follow Job Sheet #4 if necessary.	
8. Activate a dry-charged battery.	8. Observe teacher demonstration; repeat.	
9. Perform cell-to-cell voltage test.	9. Observe teacher demonstration; repeat.	
10. Perform battery leakage test.	10. Observe teacher demonstration; repeat.	
11. Remove battery cable, clean clamp and post, prepare baking soda solution.	11. Observe teacher demonstration; repeat according to Job Sheet #1.	
12. Service battery, cable, and box.	12. Observe teacher demonstration; repeat according to Job Sheet #1.	
13. Replace battery, cable, and box.	13. Follow Job Sheet #2.	

CRITERION-REFERENCED MEASURE:

Service the battery, battery box, and cables and determine battery condition and state of charge. All malfunctions identified by the instructor must be recognized and serviced, and the state of charge and serviceability must be identified accurately.

TASK INSTRUCTIONS:

1. Listen and take notes during lectures.
2. Observe films and transparencies.
3. Read information sheets on batteries.
4. Read Job Sheets #1 and 2; review Job Sheets #3 and 4.
5. Observe teacher demonstrations.
6. Perform tests as assigned.
7. Perform replacement, removal, and servicing of batteries as assigned.
8. Take quiz on batteries.

STUDENT EVALUATION:

Completion Date_____

Grade_____

Comments:

STUDENT TASK SHEET

TASK/COMPETENCY:

PERFORMANCE OBJECTIVE:

ENABLING OBJECTIVES:	LEARNING ACTIVITIES:	COMPLETED:

CRITERION-REFERENCED MEASURE:

2/84

STUDENT TASK SHEET

TASK/COMPETENCY:

PERFORMANCE OBJECTIVE:

ENABLING OBJECTIVES:	LEARNING ACTIVITIES:	COMPLETED:

CRITERION-REFERENCED MEASURE:

2/84 VVCCC

TASK INSTRUCTIONS:

STUDENT EVALUATION:

Completion Date_____

Grade_____

Comments:

LEARNING CONTRACTS

The learning contract is a management tool which allows the instructor and the individual student to agree, in advance, upon the components and outcomes of instruction. The typical learning contract contains the following elements:

- The activities to be completed by the student
- The time requirements for completion of designated activities
- The expected quality of the student's performance
- A final grade agreement
- Signatures of the instructor and student.

The learning contract involves shared responsibility and mutual obligation on the part of the student and the instructor. In essence, the instructor agrees to provide information, directions, materials, and time and to evaluate the student's performance according to predetermined criteria. In turn, the student agrees to perform the stated activities within the time limit and to an expected standard of quality.

Use of the learning contract in competency-based instruction within vocational education classrooms offers the following benefits:

- Learning contracts aid the teacher in organizing instruction so that all identified competencies are covered in the duration of the course. Individual contracts may group related competencies for more efficient use of instructional time.
- Learning contracts allow the teacher and students to take advantage of opportunities to perform jobs outside the classroom; for example, an auto mechanics instructor can schedule instruction on the cooling system when a car needing those repairs is brought into the shop.
- Learning contracts can be tailored to varied levels of student proficiency in both academic and vocational skills.
- Learning contracts meet the competency-based education requirement that students be informed of instructional tasks and performance expectations prior to instruction.

- Students who help formulate their own learning contracts may have increased motivation to perform.

- Student understanding of the world of work is increased by the use of learning contracts, and positive work attitudes such as efficiency, organization, and the acceptance of responsibility are reinforced.

LEARNING CONTRACT

Student:_____

Course:_____

I,_____,
(name of student)

agree to learn the competencies and complete the projects listed below during the six-week grading period of _____.
(dates)

Competencies/Projects:

_____

_____

_____

_____

_____

_____

_____

_____

I further agree that the quality of my completed work must comply with the standards identified for each competency.

I further agree that, upon satisfactory completion of the above, I will receive a final grade of _____ for the stated grading period.
(grade)

_____ _____
Student Date

_____ _____
Instructor Date

Self-Contained Learning Systems

Task instruction in competency-based education may be achieved through the use of self-contained learning systems such as modules or learning activity packages (LAPs). A self-contained learning system for a trade and industrial course might contain several packets, each of which is designed for instruction in a group of related competencies. By completing each packet in turn, the student eventually is able to master all task/competencies identified for the course.

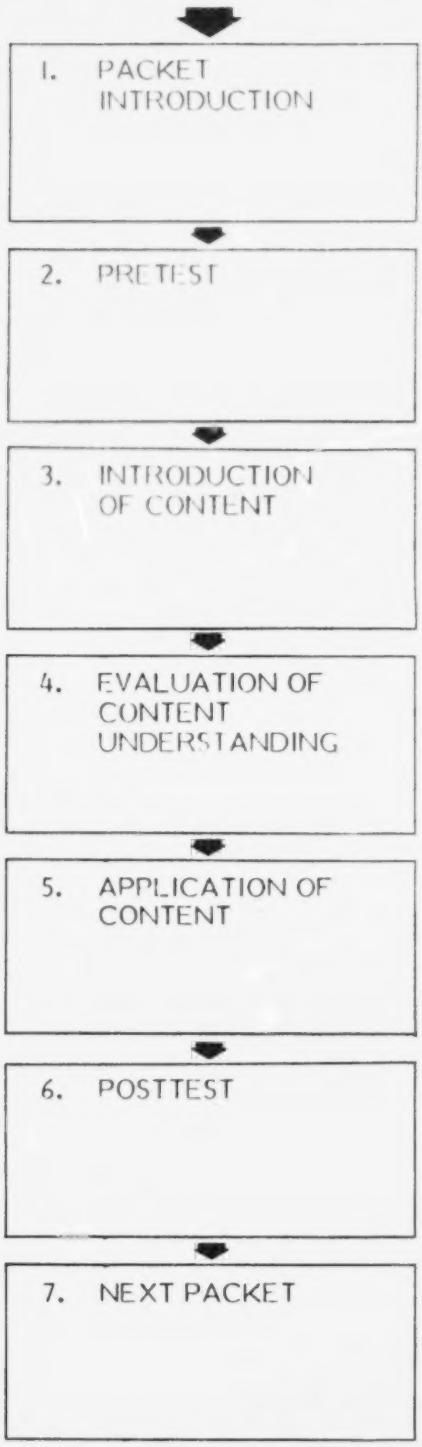
Some self-contained learning system packets contain all information, directions, and materials needed by the student for completion of activities. Other packet directions refer the student to the use of additional materials such as texts, audiovisual aids, or tools and equipment, but contain the procedures for use of all materials, whether they are located within or outside the system itself.

The procedural steps for student completion of self-contained learning system packets are represented by the sequence chart on the following page. These suggestions are offered for instructors using self-contained learning systems as a means of instructional delivery in the classroom:

- Teachers should make sure that a variety of instructional and evaluation methods are employed, and avoid situations in which students only read information and respond by writing.
- Students involved in independent use of self-contained learning system packets should be monitored frequently.
- Group instruction and group assignments should be interspersed with individual completion of packets.
- Students who need to review information or repeat learning steps in order to proceed to the next packet will most likely derive greater benefit from activities different from those originally assigned.

SELF-CONTAINED LEARNING SYSTEM SEQUENCE

Student Enters



The student carefully reviews the packet introduction, directions, enabling objectives, and performance objectives.

The student completes the packet pretest. If the established minimum score for mastery is obtained, the student proceeds to the next packet (Step 7); if not, the student proceeds to Step 3 within the same packet.

The instructional content of the packet is introduced to the student.

The student completes a response sheet which assesses his or her mastery of the content introduced in Step 3. If the established minimum score for mastery is obtained, the student proceeds to Step 5; if not, the student reviews content until mastered.

The student completes an activity designed to apply knowledge of content displayed in Step 4. Activities may include research assignments, project completion, or performance of "hands-on" tasks. When specified standards of performance are met, the student proceeds to Step 6.

The student completes the posttest. If the established minimum score for mastery is obtained, the student proceeds to the next packet; if not, Steps 3 through 5 are reviewed until the minimum score is obtained.

Steps 1 through 6 are continued for each successive packet until all system packets have been completed.

TASK BOARD MANAGEMENT SYSTEM

This individualized learning system uses a competency board to enable the student and teacher to identify at any time exactly where the student is in terms of the task sequence for a particular course. It allows the teacher to organize tasks based on availability of equipment and student skill levels, and allows the student to keep track of his or her own progress. It also gives the instructor the flexibility to use locally produced recording forms and to tailor the system to locally identified competencies.

The competency board consists of three elements: a task list (which may comprise several pages), with each task identified by a number; task assignment cards (see Figure 3); and a student nameplate with a hook for each student's cards. The cards may be color-coded to denote varying skill levels. To begin a task, the student obtains a blank task assignment card, fills in the information required, hangs the card on the hook below his or her name, and receives instructions on how to do the task. Instructions may take the form of teacher or advanced-student demonstrations, job sheets from Mid-America, instructor-prepared student task sheets, textbook or operator manual directions, or any other available source. When the student achieves competency in the task, the instructor initials the task assignment card and places the card back on the hook. The instructor records the task grades on a permanent recording form at regular intervals. The student then fills out a new task assignment card, and repeats the procedure.

In programs with a set sequence, such as welding, the student will follow the task list on the board. In programs where the sequence may vary because of equipment availability or customer work, such as small engine repair or auto mechanics, the instructor assigns each task to each student, depending on the student's skill level and individual needs.

Recording Forms: An ideal recording form to accompany the competency board is one which matches each task to a single occupational title or set of titles (see sample Virginia T & I Instructional Management System form in Section IV). The instructor can refer to Section I of this resource, select those occupational titles appropriate to the locality, and as each task/competency is achieved, record the student's grade under the related job title(s). It is strongly suggested that the local craft advisory committee validate the selected occupational titles and their related tasks.

TASK ASSIGNMENT

Name:_____

Task No._____

Starting Date:_____

Completion Date:_____

Remarks:_____

_____

Instructor_____

Grade: ☐

Figure 3--Task Assignment Card for Task Board Management System
(May Be Color-Coded to Denote Varying Skill Levels)

SECTION IV.

RECORDING SYSTEMS

Competency-based vocational education in Virginia requires a system for documenting competencies which have been achieved by each student. This information is essential to the student, teacher, and employer. For the student, it provides a record of successful progress through the vocational program. If the student should transfer to another school or enter the community college system, the record will assist in a smooth transition--eliminating the need to repeat skills and knowledge learned. Therefore, the competency record facilitates articulation between and among vocational programs at different levels of instruction. The teacher uses the competency record for evaluation and planning purposes in the course. Perhaps the most important use of a competency recording system is the provision of specific job-entry information to prospective employers.

This section contains information on the characteristics of grading and recording systems for competency-based education. The recording systems were designed for use by the instructor, student, student records personnel, and the employer. Samples of psychomotor grading systems and a system for combining affective, cognitive, and psychomotor grades also are included.

GRADING

Local school boards establish the grading system for their school divisions; therefore, any proposed system in which competency attainment is converted to an overall grade must be based on local requirements. This must be underscored in considering principles of CBE grading.

It is generally agreed that grading each competency should go beyond the pass-fail stage and should include an indication of the degree of skill the student has demonstrated. In addition, the grade may be based on more than just the performance (psychomotor) level and include the knowledge (cognitive) and personal behavior (affective) areas. The time required by a student to reach a specific performance level should not be considered in rating a student.

Grades from any system will, of course, need to be converted to the conventional A, B, C, D, F system for reporting of grades. The grade for each individual competency must, though, be retained in a student file for use by employers, etc.

Passing (or failing) grades for a course can be accomplished in several ways, such as establishing a minimum number of competencies which must be mastered fully, the number of competencies mastered, or averaging of the scores on only those competencies actually mastered.

CHARACTERISTICS OF GRADE SYSTEMS FOR CBE

1. Each student should be graded on his or her own level of achievement and not in comparison to other students.
2. The minimum acceptable level of achievement should be based on the minimum entry level in the industry or trade.
3. The grading system should be based on nonpunitive strategies. Grades for competencies achieved should not be lowered by competencies not achieved.
4. The system should provide recognition for achievement beyond the minimum level.
5. In an articulated program, both secondary and post-secondary instructors must agree on the same criteria or standards to be achieved for each competency.
6. The evaluation system (letter grade, points, etc.) must be related to the competency criteria standard. For example, the terms excellent, good, average for the letter grades A, B, C should not be used.

7. The grading composition (e.g., percentage for attendance, attitude, etc.) must be made known to the student. It is suggested that three grades be given--one for performance, one for attendance/attitudes, and one for technical knowledge.

8. A minimum number of competencies should be equated to different letter grades. For example, a student receiving an A grade must have achieved 90 percent of the competencies for the occupation.

9. The time required for a student to master a competency should not be considered in rating a student, except as reflected in #8, above.

10. Letter grades should not be placed on competency sheets, but on the official transcript.

11. A point system should be used for all competency-based courses. This allows for a standard grade translation.

PSYCHOMOTOR GRADING

4, 3, 2, 1, 0 System

This system is the most widely used and is recommended since it easily converts to the A, B, C, D, F and decimal systems, A being 4 and F being 0. An average of 3.7 would be a grade of 94.25 percent, etc.

4 - Highly proficient: The student can complete task quickly and accurately, can direct others in how to do task, and needs only normal supervision.

3 - Competent: The student can complete all parts of the task, needs only a spot check of completed work, meets minimum entry level requirements, and needs job entry supervision.

2 - Partially proficient: The student can complete most parts of the task, needs help only on hardest parts, may not meet all job-entry level requirements for speed and accuracy, and needs close supervision.

1 - Extremely limited: The student can complete simple parts of task, needs to be told or shown how to do most of task, and needs extremely close supervision.

0 - The student cannot perform any part of task at a level sufficient for participation in a work environment.

X - The student did not attempt the task.

5, 4, 3, 2, 1 System

5 - The student can complete all parts of the task accurately and independently in less than the allotted time.

4 - The student can complete all parts of the task with little assistance in the allotted time.

3 - The student can complete most parts of the task accurately with some assistance.

2 - The student can complete some parts of the task but needs help on most difficult parts.

1 - The student's attempt was incomplete or incorrect.

X - The student did not attempt the task.

3, 2, 1, 0 System

3 - The student can perform task/competency above job-entry level.

2 - The student can perform task/competency at job-entry level.

1 - The student can perform task/competency below job-entry level.

0 - The student cannot perform task/competency.

X - The student did not attempt the task.

6, 5, 4, 3, 2, 1, 0 System

6 - The student can perform this task without supervision or assistance and can lead others in performing it.

5 - The student can perform this task without supervision or assistance with initiative and adaptability to special problem situations.

4 - The student can perform this task without supervision or assistance with proficiency in speed and quality.

3 - The student can perform this task satisfactorily without assistance or supervision.

2 - The student can perform this task satisfactorily but requires supervision and/or assistance.

1 - The student can perform some parts of this task satisfactorily but requires instruction and supervision to perform entire task.

0 - The student has some knowledge and limited experience but not sufficient for participation in a work environment.

GRADING SYSTEM INCLUDING AFFECTIVE, COGNITIVE, AND PSYCHOMOTOR ABILITIES

1. The cognitive grade should be determined from an average of tests and quizzes.

2. The affective grade should be determined by considering the following on a 4, 3, 2, 1 or 5, 4, 3, 2, 1 or similar system:

   a. Use of correct safety procedures
   b. Good use of time
   c. Punctuality
   d. Ability to follow instructions
   e. Ability to work well with others
   f. Care of tools, equipment, and building
   g. Pride in workmanship
   h. Regular attendance.

3. The psychomotor grade should be determined from a 4, 3, 2, 1 or 5, 4, 3, 2, 1 or similar system.

4. The three grades should be averaged in the following way:

   Psychomotor grade x .5 + affective grade x .25 + cognitive grade x .25 = final grade.

CHARACTERISTICS OF RECORDING SYSTEMS FOR CBE

1. A common recording system should be used at both high school and community college levels.

2. The recording system must be an official school record and should be part of students' permanent files.

3. The recording system must contain a listing of all competencies in the occupational program.

4. A rating system should identify competencies achieved, designate the level of student performance, and provide an interpretation of the rating scale.

5. The record should include as a minimum:

   a. Occupational title
   b. Signatures of student, instructor, and school official
   c. Competency list.

RECORDING FORMS

Examples of several types of recording forms follow. The individual student record forms designate the task/competencies identified in a trade and industrial education program. These are useful in maintaining an ongoing record of a student's progress through a program and, as such, are appropriate for inclusion in a student's permanent file. Four examples of student record forms are included:

Type A incorporates both secondary and postsecondary programs.

Type B records achievement in a single program.

Type C relates each task in a course to a specific occupational title.

Type D is the Competency Profile from Mid-America, which consists of a self-contained folder with inserts.

Both sample (filled-in) forms and blank forms (for duplication purposes) are given for Types A, B, and C. The Mid-America Competency Profile folders are included in their teacher edition course material package.

NOTE: Task inventories and occupational titles identified by other states should be validated and adapted for local requirements, if necessary, before inclusion in Virginia vocational programs.

Class progress charts also designate the task/competencies identified in a specific trade and industrial education course. The usefulness of these charts, however, is in their planning, organizational, and evaluative aid to the individual course instructor. Examples of two class program charts are included. Sample and blank forms are shown for both types.

COMPETENCY RECORD

NAME _____ SSN _____ SCHOOL(S) _____

SECONDARY PROGRAM AUTO MECHANICS I (8506) INSTRUCTOR _____

POSTSECONDARY PROGRAM _____ INSTRUCTOR _____

STUDENT'S SIGNATURE _____ DATE _____

GRADING SYSTEM*
4--Highly proficient
3--Competent
2--Partially proficient
1--Limited
0--Cannot perform
X--Task not attempted
*Detailed explanation on reverse side

PERSONAL CHARACTERISTICS	SECONDARY			POSTSECONDARY		
	GRADE	DATE	INITIALS	GRADE	DATE	INITIALS
Uses time well						
Is punctual						
Follows instructions						
Works well with others						
Takes care of tools and equipment						
Takes pride in work						
Attends regularly						
Is ambitious						
Communicates well with others						

TASK/COMPETENCIES		SECONDARY			POSTSECONDARY		
		GRADE	DATE	INITIALS	GRADE	DATE	INITIALS
1.7	Determine year of manufacture						
20.2	Adjust tire pressure						
20.7	Adjust brake fluid level						
20.9	Adjust coolant level						
20.10	Adjust electrolyte level						
20.8	Adjust manual and power steering fluid levels						
20.3	Change engine oil						
20.4	Change engine oil filter						
20.1	Lubricate front and rear suspensions						
20.6	Adjust differential fluid level						
20.5	Adjust transmission fluid level						

GRADING SYSTEM

4--Highly proficient: The student can complete task quickly and accurately, can direct others in how to do task, and needs only normal supervision.

3--Competent: The student can do all parts of the task, needs only spot check of completed work, meets minimum entry-level requirements, and needs job entry supervision.

2--Partially proficient: The student can do most parts of the task, needs help only on hardest parts, may not meet all job entry-level requirements for speed and accuracy, and needs close supervision.

1--Limited: The student can do simple parts of task, needs to be told or shown how to do most of task, and needs extremely close supervision.

0--The student cannot perform any part of task at a level sufficient for participation in a work environment.

X--The student did not attempt the task.

STUDENT RELEASE

I, _____, hereby authorize the release of the information on this form for the purpose of awarding me credit for the competencies I have mastered.

_____
Signature

COMPETENCY RECORD

NAME _____ SSN _____ Page _____ of _____

	TASK/COMPETENCIES	SECONDARY			POSTSECONDARY		
		GRADE	DATE	INITIALS	GRADE	DATE	INITIALS
10.7	Steam clean engine						
3.3	Pressure test cooling system						
3.5	Inspect, adjust, and replace fan belts						
3.1	Check coolant operating temperature						
3.7	Replace radiator hoses						
3.6	Replace radiators						
3.8	Replace water pump						
3.10	Remove, test, and replace thermostat						
3.9	Repair minor leaks in radiators						
3.11	Diagnose and correct overheating						
3.4	Chemically clean and flush cooling system						
6.2	Determine battery state of charge						
6.4	Charge a battery						
6.3	Load test a battery						
6.1	Service or replace batteries, cables, and battery box						
14.4	Determine tire and wheel runout						
14.2	Remove, inspect, and replace a tire on a wheel						
14.3	Repair a tire puncture						
14.1	Inspect, repack, and adjust front wheel bearings						
1.4	Inspect exhaust system						
9.12	Replace tail and exhaust pipes						
9.13	Replace muffler						
9.10	Service or repair manifold heat controls (heat risers)						
10.8	Remove and replace exhaust manifolds						
12.1	Adjust brake shoes						
12.2	Bleed hydraulic brakes						
12.3	Inspect brake drums						

COMPETENCY RECORD

NAME _____ SSN _____ SCHOOL(S) _____

SECONDARY PROGRAM _____ INSTRUCTOR _____

POSTSECONDARY PROGRAM _____ INSTRUCTOR _____

STUDENT'S SIGNATURE _____ DATE _____

GRADING SYSTEM*
4--Highly proficient
3--Competent
2--Partially proficient
1--Limited
0--Cannot perform
X--Task not attempted
*Detailed explanation on reverse side

PERSONAL CHARACTERISTICS	SECONDARY			POSTSECONDARY		
	GRADE	DATE	INITIALS	GRADE	DATE	INITIALS
Uses time well						
Is punctual						
Follows instructions						
Works well with others						
Takes care of tools and equipment						
Takes pride in work						
Attends regularly						
Is ambitious						
Communicates well with others						

TASK/COMPETENCIES	SECONDARY			POSTSECONDARY		
	GRADE	DATE	INITIALS	GRADE	DATE	INITIALS

GRADING SYSTEM

4--Highly proficient: The student can complete task quickly and accurately, can direct others in how to do task, and needs only normal supervision.

3--Competent: The student can do all parts of the task, needs only spot check of completed work, meets minimum entry-level requirements, and needs job entry supervision.

2--Partially proficient: The student can do most parts of the task, needs help only on hardest parts, may not meet all job entry-level requirements for speed and accuracy, and needs close supervision.

1--Limited: The student can do simple parts of task, needs to be told or shown how to do most of task, and needs extremely close supervision.

0--The student cannot perform any part of task at a level sufficient for participation in a work environment.

X--The student did not attempt the task.

STUDENT RELEASE

I, _____, hereby authorize the release of the information on this form for the purpose of awarding me credit for the competencies I have mastered.

_____
Signature

COMPETENCY RECORD

NAME _____ SSN _____ Page _____ of _____

TASK/COMPETENCIES	SECONDARY			POSTSECONDARY		
	GRADE	DATE	INITIALS	GRADE	DATE	INITIALS

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Individual Student Chart--Type B--SAMPLE (Partial List)

V O C A T I O N A L E D U C A T I O N
C O M P E T E N C Y R E C O R D

Name of Student _____

School _____

Program Area: Auto Mechanics and Servicing

Course Title: Auto Mechanics II

CIP Code No. 47.0604

VA Course No. 8507

CERTIFICATION OF COMPETENCY

I hereby certify that the student named above has achieved the level of proficiency at the time of testing shown for each of the competencies on the attached list and has completed _____ hours of instruction with an attendance rate of _____ percent.

_____
Instructor's Signature

_____
Date

ADDITIONAL COMMENTS:

_____

_____

_____

_____

_____

INTERPRETATION OF SYMBOLS AND STUDENT SCORES

PERFORMANCE LEVEL

Proficiency 4:	HIGHLY PROFICIENT: The student can complete task quickly and accurately, can direct others in how to do the task, and needs normal supervision (94%-100%).
Proficiency 3:	COMPETENT: The student can do all parts of task, meets minimum local demands for speed and accuracy, and needs job entry supervision (87%-93%).
Proficiency 2:	PARTIALLY PROFICIENT: The student can do most parts of task, needs help only on hardest parts, may not meet local demands for speed and accuracy, and needs close supervision (79%-86%).
Proficiency 1:	EXTREMELY LIMITED: The student can do simple part of task, needs to be told/shown how to do most of the task, and needs extremely close supervision (70%-78%).
Proficiency 0:	The student's degree of skill is below minimally acceptable performance level (69% or below).

KNOWLEDGE LEVEL

Knowledge Level A:	OPERATING PROFICIENCY: The student can identify, measure, and use troubleshooting techniques to resolve task-related problems and can evaluate conditions and make proper decisions (94%-100%).
Knowledge Level B:	TECHNIQUES AND PRINCIPLES: The student can explain how and when task must be done and why each step is needed, can interpret written and oral instructions, and can analyze facts/principles (87%-93%).
Knowledge Level C:	PROCEDURES: The student can name most steps in task, needs help interpreting written instructions, and can explain basic facts and state general principles (79%-86%).
Knowledge Level D:	NOMENCLATURE: The student can identify parts and tools, and understand simple facts about task, and can identify related basic facts and terms (70%-78%).
Knowledge Level E:	The student's knowledge is below minimally acceptable standard (69% or below).

WORK HABITS AND ETHICS

Level A:	HIGHLY ACCEPTABLE: This is an area in which extraordinary strength is shown.
Level B:	VERY ACCEPTABLE: This is an area in which more than average strength is shown.
Level C:	ACCEPTABLE: This is an area in which average strength is shown.
Level D:	PARTIALLY ACCEPTABLE: This is an area in which some improvement is needed.
Level E:	NOT ACCEPTABLE: This is an area needing considerable improvement.

Page ____ of ____

Name _____ Program Area Auto Mechanics & Servicing

Course Title Auto Mechanics II

TASK NO.	TASK/COMPETENCY	PERFORMANCE					KNOWLEDGE					DATE
		4	3	2	1	0	a	b	c	d	e	
4.10	Locate & replace blown fuses											
4.1	Locate and repair shorted or open circuits											
4.3	Repair or replace lighting system components											
4.5	Replace flasher units											
4.9	Diagnose and repair direction signal circuits											
4.8	Diagnose ignition switch malfunctions											
4.6	Replace ignition switch and resistor											
4.11	Test and repair indicator lamp circuitry											
4.7	Test dash units											
9.7	Test gas tank sending unit											
4.2	Replace electrical accessories											
4.4	Replace chassis and underhood wiring											
5.4	Remove & replace starter											
5.2	Replace solenoids											
5.3	Repair starter											
5.6	Test starter circuit and starter control resistance											
5.5	Load test starter											
5.1	Analyze malfunctions in cranking system											
7.3	Remove and replace generator/alternator											
7,1	Evaluate generator/ alternator output											
7.4	Test and adjust external type voltage regulator											
7.5	Test internal-type voltage regulator											

Page _____ of _____

Name _____ Program Area _____

Course Title _____

NO.	EDUCATION/TECHNICAL KNOWLEDGE/ JOB PHYSICAL PROFILE Examples: 1. Uses instructions furnished in written or oral form 2. Able to use fingers, hands, arms to reach, handle,	PERFORMANCE					KNOWLEDGE				
		4	3	2	1	0	a	b	c	d	e

NO.	WORK HABITS AND ETHICS Examples: 1. Accepts constructive criticism 2. Demonstrates correct safety practices	WORK HABITS AND ETHICS				
		A	B	C	D	E

Student Record Form--Type B

VOCATIONAL EDUCATION
COMPETENCY RECORD

Name of Student _____

School _____

Program Area: _____

Course Title: _____

CIP Code No. _____

VA Course No. _____

CERTIFICATION OF COMPETENCY

I hereby certify that the student named above has achieved the level of proficiency at the time of testing shown for each of the competencies on the attached list and has completed _____ hours of instruction with an attendance rate of _____ percent.

_____
Instructor's Signature

_____
Date

ADDITIONAL COMMENTS:

_____

_____

_____

_____

_____

INTERPRETATION OF SYMBOLS AND STUDENT SCORES

PERFORMANCE LEVEL

Proficiency 4:	HIGHLY PROFICIENT: The student can complete task quickly and accurately, can direct others in how to do the task, and needs normal supervision (94%-100%).
Proficiency 3:	COMPETENT: The student can do all parts of task, meets minimum local demands for speed and accuracy, and needs job entry supervision (87%-93%).
Proficiency 2:	PARTIALLY PROFICIENT: The student can do most parts of task, needs help only on hardest parts, may not meet local demands for speed and accuracy, and needs close supervision (79%-86%).
Proficiency 1:	EXTREMELY LIMITED: The student can do simple part of task, needs to be told/shown how to do most of the task, and needs extremely close supervision (70%-78%).
Proficiency 0:	The student's degree of skill is below minimally acceptable performance level (69% or below).

KNOWLEDGE LEVEL

Knowledge Level A:	OPERATING PROFICIENCY: The student can identify, measure, and use troubleshooting techniques to resolve task-related problems and can evaluate conditions and make proper decisions (94%-100%).
Knowledge Level B:	TECHNIQUES AND PRINCIPLES: The student can explain how and when task must be done and why each step is needed, can interpret written and oral instructions, and can analyze facts/principles (87%-93%).
Knowledge Level C:	PROCEDURES: The student can name most steps in task, needs help interpreting written instructions, and can explain basic facts and state general principles (79%-86%).
Knowledge Level D:	NOMENCLATURE: The student can identify parts and tools, and understand simple facts about task, and can identify related basic facts and terms (70%-78%).
Knowledge Level E:	The student's knowledge is below minimally acceptable standard (69% or below).

WORK HABITS AND ETHICS

Level A:	HIGHLY ACCEPTABLE: This is an area in which extraordinary strength is shown.
Level B:	VERY ACCEPTABLE: This is an area in which more than average strength is shown.
Level C:	ACCEPTABLE: This is an area in which average strength is shown.
Level D:	PARTIALLY ACCEPTABLE: This is an area in which some improvement is needed.
Level E:	NOT ACCEPTABLE: This is an area needing considerable improvement.

Page _____

Name _____ Program Area _____

Course Title _____

TASK NO.	TASK/COMPETENCY	PERFORMANCE					KNOWLEDGE					DATE
		4	3	2	1	0	a	b	c	d	e	

Page ____ of ____

Name _____ Program Area _____

Course Title _____

NO.	EDUCATION/TECHNICAL KNOWLEDGE/ JOB PHYSICAL PROFILE Examples: 1. Uses instructions furnished in written or oral form 2. Able to use fingers, hands, arms to reach, handle,	PERFORMANCE					KNOWLEDGE				
		4	3	2	1	0	a	b	c	d	e

NO.	WORK HABITS AND ETHICS Examples: 1. Accepts constructive criticism 2. Demonstrates correct safety practices	WORK HABITS AND ETHICS				
		A	B	C	D	E

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

STUDENT'S NAME _____

PROGRAM Auto Mechanics and Servicing

CIP CODE 47.0604/47.0601

COURSE Auto Mechanics II (8507)

SCHOOL _____

INSTRUCTOR _____

	DATE COMP.	GRADE	Automobile Mechanic Helper 620.684-014	Auto Repair/Service Manager 620.261-018	Air Conditioning Mechanic 620.281-010	Front End Mechanic 620.281-038	Transmission Mechanic 620.281-062	Carburetor Mechanic 620.281-034	Brake Repairer 620.281-026	Tune-Up Mechanic 620.281-066	Automobile Electrician 825.281-022	Automobile Mechanic 620.261-010
Locate and replace blown fuses			X	X	X		X	X			X	X
Locate and repair shorted and open circuits			X	X	X		X	X		X	X	X
Repair or replace lighting system components			X	X	X		X			X	X	X
Replace flasher units			X	X							X	X
Diagnose and repair direction signal circuits				X							X	X
Diagnose ignition switch malfunctions				X						X	X	X
Replace ignition switch and resistor										X	X	X
Test and repair indicator lamp circuitry				X	X			X		X	X	X
Test dash units				X						X	X	X
Test gas tank sending unit			X	X							X	X
Replace electrical accessories			X	X	X					X	X	X
Replace chassis and underhood wiring										X	X	X
Remove and replace starter			X								X	X
Replace solenoids			X								X	X
Repair starter											X	X
Test starter circuit and starter control resistance											X	X

Individual Student Chart--Type C--SAMPLE (Partial List)

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VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

STUDENT'S NAME _____

PROGRAM Auto Mechanics and Servicing

CIP CODE 47.0604/47.0601

COURSE Auto Mechanics II (8507)

SCHOOL _____

INSTRUCTOR _____

	DATE COMP.	GRADE	Automobile Mechanic Helper 620.684-014	Auto Repair/Service Manager 620.261-018	Air Conditioning Mechanic 620.281-010	Front End Mechanic 620.281-038	Transmission Mechanic 620.281-062	Carburetor Mechanic 620.281-014	Brake Repairer 620.281-026	Tune-Up Mechanic 620.281-066	Automobile Electrician 825.281-022	Automobile Mechanic 620.261-010
Load test starter			X	X							X	X
Analyze malfunctions in cranking system				X						X	X	X
Remove and replace generator/alternator											X	X
Evaluate generator/alternator output				X							X	X
Test and adjust external-type voltage regulator				X							X	X
Test internal-type voltage regulator				X							X	X
Repair generator/alternator											X	X
Use electronic engine analyzer				X				X		X	X	X
Perform cylinder balance test			X	X						X		X
Perform cylinder compression test			X	X						X		X
Disassemble, repair, and reassemble distributor										X	X	X
Perform cylinder leakage test			X	X						X		X
Perform operational inspection of lubrication system			X	X								X
Diagnose and repair electronic ignition system				X						X	X	X
Diagnose/repair or replace positive crankcase ventilation system components			X	X						X		X
Diagnose/service, repair, or replace fuel evaporation system components				X				X		X		X

Fig. Individual Student Chart--Type C--SAMPLE (Partial list)

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

Page_____ of _____

STUDENT'S NAME _____

PROGRAM _____

CIP CODE _____

COURSE _____

SCHOOL _____

INSTRUCTOR _____

	DATE COMP.	GRADE										

Student Record Form--Type C

Type D--SAMPLE
Mid-America Competency Folder--Outside Front Cover

AUTO MECHANICS
COMPETENCY PROFILE

Instructor _____ Date _____

Program _____ Grade: _____ School: _____

Name: _____ Soc. Sec. No: _____ Phone: _____
Last Middle First

Address: _____ Date of Birth: ____-____-____ Age: _____ Sex: _____

In Case of Emergency, Contact: _____ Address: _____ Phone: _____

or

_____ Address: _____ Phone: _____

Insurance Co: _____ Insurance No: _____

Family Doctor: _____ Office Phone: _____ Home Phone: _____

Allergies/Handicaps (Please Specify) _____

The above information can be used for school records and or to insure safety of students. This confidential information is not to be released to employers or the general public.

Date of Enrollment: ____-____-____ Total Class Hours: _____

Date of Withdrawal: ____-____-____ Total on-the-Job Training Hours: _____

Date of Completion: ____-____-____ Total Shop Hours: _____

Total Hours Absent: _____ Total Hours Tardy: _____

ON-JOB-TRAINING/WORK EXPERIENCE

Duration of Employment	Job Title	Supervisor's Name	Address of Employer	Phone

Nondiscrimination Statement
The Oklahoma State Department of Vocational and Technical Education does not discriminate on the basis of race, creed, color, national origin, sex, age, veteran status, qualified handicap or disability

A Hand Tools (Overall Average)
1. Sharpen a twist drill
2. Drill holes with a drill press
3. Reshape a cold chisel
4. Cut flat metal with a cold chisel
5. Dress a grinding wheel
6. Fit a screwdriver
7. Replace a hammer handle
8. Check torque wrench for accuracy
9. Draw file a flat surface
10. Draw a twist drill hole to correct center

B Arc Welding
1. Start, stop and restart a bead
2. Construct a pad weld
3. Construct a butt weld

C Oxyacetylene Cutting
1. Set up equipment for oxyacetylene cutting
2. Turn on, light, adjust, and turn off the cutting torch
3. Make straight, curved, angle cuts on mild steel and restart a cut
4. Cut round stock

D Oxyacetylene Fusion Welding
1. Turn on, light, adjust, and turn off oxyacetylene welding equipment
2. Construct a corner weld without filler rod
3. Lay beads on gauge metal without filler rod
4. Lay beads on gauge metal with filler rod
5. Weld butt joints with filler rod

E Oxyacetylene Braze Welding
1. Braze weld a square groove butt joint

F Rules
1. Draw lines
2. Measure lines
3. Apply line measurement
4. Apply circular measurement

G Outside Micrometer
1. Read plain micrometer settings
2. Read vernier micrometer settings
3. Use the plain micrometer
4. Use the vernier micrometer

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H Inside Micrometer
1. Read inside micrometer settings
2. Use the inside micrometer

I Basic Engine Principles
1. Calculate work
2. Calculate horsepower
3. Calculate torque
4. Calculate cubic inch displacement

J Cooling System
1. Remove, check, and replace a thermostat
2. Remove and replace a water pump
3. Remove and replace a radiator
4. Pressure test the cooling system
5. Remove, inspect, and replace V-belts
6. Test anti-freeze solution

K Engine Lubrication System
1. Change oil in an engine
2. Change an oil filter

L Exhaust System
1. Service a manifold heat control valve
2. Remove and replace an exhaust manifold
3. Remove and replace an exhaust pipe
4. Remove and replace a muffler
5. Remove and replace a catalytic converter
6. Remove and replace a tail pipe

M Fuel System
1. Volume and pressure test a fuel pump
2. Remove and replace a fuel pump
3. Service an air cleaner
4. Remove and replace a carburetor
5. Disassemble, adjust, and reassemble a carburetor

N Wheel Bearings
1. Clean and inspect a bearing
2. Adjust front wheel bearings
3. Pack a front wheel bearing assembly

O Tires and Wheels
1. Remove, inspect, and replace a tire on a wheel
2. Repair a tire puncture

P Wheel Balancing
1. Check tire and wheel runout
2. Static balance a tire and wheel assembly
3. Spin balance a tire and wheel assembly on a car

Q Suspension System
1. Inspect and replace shock absorbers
2. Inspect front suspension systems for wear
3. Repair an upper control arm assembly or a lower control arm mounted coil spring
4. Repair a lower control arm

R Steering System
1. Inspect a steering system for damaged parts or wear
2. Remove and replace a tie rod end
3. Pressure test a power steering system
4. Remove, reseal, and replace a recirculating ball type steering gear

S Wheel Alignment
1. Make preliminary checks before wheel alignment
2. Align a front end

T Brake System
1. Adjust brake shoes
2. Bleed the brake system
3. Remove, inspect and replace brake drums
4. Remove and replace brake shoes
5. Remove, recondition and replace a wheel cylinder
6. Remove, recondition and replace a standard master cylinder
7. Remove, recondition and replace a tandem master cylinder

U Power Disc Brakes
1. Test the hydraulic system
2. Test the vacuum power booster
3. Repair a sliding caliper disc brake
4. Check disc runout and thickness

V OTHER
1. _____
2. _____
3. _____

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SPECIFIC JOB COMPETENCIES

DIRECTIONS: Evaluate the student's performance using the rating scale below and check the appropriate number to indicate their degree of competency. The numerical ratings of 4, 3, 2 and 1 are not intended to represent the traditional school grading system of A, B, C and D. Ratings should reflect JOB READINESS for each of the tasks rather than the grade given in the class.

KEY:
- 4 - Skilled: can work independently with no supervision
- 3 - Moderately Skilled: can perform job competently with limited supervision
- 2 - Limited Skill: requires instruction and close supervision
- 1 - Not Proficient: No Experience or knowledge in this area

AUTO MECHANICS SPECIALIZED UNITS

CHASSIS SUSPENSION

4	3	2	1

A. Hydraulics
1. Identify the components of a basic hydraulic system
2. Identify types of automatic transmission hydraulic control valves
3. Distinguish between mechanical and hydraulic balanced directional control valves

4	3	2	1

B. Planetary Gearsets
1. Identify planetary gearset components
2. Identify planetary gearset controls used in automatic transmissions
3. Describe direct drive mode
4. Describe speed reduction mode
5. Describe reverse gear mode

4	3	2	1

C. Torque Converters
1. Identify basic components of a torque converter
2. Match components of a torque converter to the correct construction features
3. State the purposes of the stator
4. Select principles of torque multiplication
5. Select operations of an over-running clutch

4	3	2	1

D. Automatic Transmission Design
1. Identify main components of an automatic transmission
2. Trace mainline oil circuit
3. Trace governor oil circuit
4. Trace lubrication oil circuit

4	3	2	1

E. Automatic Transmission Operation
1. Identify transmission power flow
2. Identify transmission fluid circuits
3. Arrange in order the operation of the shift control for a single planetary gearset
4. Describe operation of throttle valve
5. Arrange in order the operation of governor
6. Describe operation of an accumulator

4	3	2	1

F. Automatic Transmission Repair
1. Select causes of specific transmission malfunctions
2. Select areas to inspect for wear and damage on transmission parts
3. Perform fluid pressure test on an automatic transmission
4. Remove and reinstall an automatic transmission
5. Disassemble and inspect an automatic transmission
6. Reassemble an automatic transmission

4	3	2	1

G. Automatic Transmission Troubleshooting
1. Select basic steps in troubleshooting automatic transmission
2. Arrange in order the steps to follow in reaching a conclusion
3. Select correct questions to ask customers
4. Discuss procedures for inspecting the vehicle
5. List possible causes of vehicle malfunctions
6. Trouble-shoot automatic transmission problems

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POWER STEERING

4	3	2	1

A. Linkage Type
1. Identify major parts of linkage type control valve
2. Describe the operation of linkage type power steering system
3. Remove and install linkage type power steering control valve
4. Disassemble, inspect, and reassemble linkage type power steering control valve
5. Remove, service and reinstall linkage type power steering cylinder

4	3	2	1

B. Constant Control
1. Identify components of constant control power steering gear
2. Describe operation of constant control power steering gear valve assembly
3. Remove, install and bleed a constant control power steering gear
4. Disassemble, inspect and reassemble a constant control power steering gear

4	3	2	1

C. Rotary Valve
1. Identify components of a rotary valve power steering gear
2. Describe the operation of rotary valve power steering gear in the straight-ahead position and turning position
3. Remove, install and bleed rotary valve power steering gear
4. Disassemble, inspect and reassemble a rotary valve power steering gear

4	3	2	1

D. Rack and Pinion
1. Identify parts of rack and pinion power steering gear
2. Describe operation of rack and pinion power steering gear
3. Select precautions to follow when servicing rack and pinion power steering gear
4. Remove and replace rack and pinion power steering gear
5. Replace outer tie rod end and boot

4	3	2	1

E. Power Steering Troubleshooting
1. Select basic steps in troubleshooting
2. List procedures for inspecting vehicle
3. Select correct questions to ask customer
4. List possible causes of vehicle malfunctions
5. Arrange steps to follow in reaching conclusion
6. Trouble-shoot power steering problems

Mid-America Competency Folder--Insert

PROGRAM: _____

STUDENT'S NAME: _____

DATE OF EVALUATION: _____

PERIOD COVERED: _____

INTERPERSONAL COMPETENCIES

DIRECTIONS: Check appropriate number to indicate your personal evaluation of the student's behavior as observed by you during the training period indicated above. Evaluate only those interpersonal competencies for which you have sufficient experience or evidence upon which to base an evaluation.

* RATING SCALE:
4. Exceptional/Always
3. Usually Successful
2. About 50-50
1. Seldom/Avoids

4	3	2	1	
				CONFIDENCE - Believes in self; others respect, admire and emulate
				PERSEVERANCE - Continues difficult tasks until completed
				COMPREHENSION - Pays attention and "catches on" to ideas/situations
				INITIATIVE - Finds work to do without being told; is self-motivated; is first one to begin work
				RELIABILITY - Does tasks assigned without constant supervision
				TACT - Is careful not to hurt other's feelings or cause anger
				LOYALTY - Stands up for personal values and fully supports supervisors
				ENTHUSIASM - Demonstrates desire to learn and please; eager, earnest, zealous worker
				COOPERATION - Demonstrates willingness to work as a team member and assist others
				ADAPTABILITY - Adjusts to changes in schedules, job assignments, supervisors
				SAFETY CONSCIOUS - Observes safety rules and regulations
				HOUSEKEEPING - Maintains tools, equipment and work stations
				ORAL EXPRESSION - States information in a clear, logical order
				SOCIABLE - Makes friends easily and is open-minded
				GROOMING - Dresses appropriately for variety of occasions
				LEADERSHIP - Gets others to cooperate and channel their efforts towards a common goal
				POISE - Maintains self-control

* These evaluations were made from personal observations during the student's training and may vary from one individual to another. No effort was made to measure these affective competencies quantitatively.

EVALUATOR'S SIGNATURE: _____ DATE: _____

* The above information can be used for school records and/or to insure safety of students. This confidential information is not to be released to employers or the general public.

DIRECTIONS Evaluate the Trainee using the rating scale below and check the appropriate number to indicate their degree of competency. The numerical ratings 4, 3, 2, and 1 **are not intended** to represent the traditional school grading system of A, B, C and D. Ratings should reflect JOB READINESS for each of the tasks rather than the grade given in the class.

Rating Scale
4 - Skilled--can work independently with no supervision
3 - Moderately Skilled--can perform job completely with limited supervision
2 - Limited Skill--requires instruction and close supervision
1 - No Exposure--No Experience or knowledge in this area

4	3	2	1

A. Engine Condition Evaluation
1. Complete a chart for trouble shooting internal engine noise
2. Test engine compression
3. Perform cylinder leakage test

B. Engine Removal
1. Remove an engine with an automatic transmission
2. Remove engine with standard transmission

C. Engine Disassembly
1. Clean outside of engine
2. Disassemble engine

D. Valve Train Cylinder Head Reconditioning
1. Inspect timing gears and measure timing chain for stretch and camshaft end play
2. Inspect camshaft
3. Clean and inspect hydraulic lifters
4. Disassemble, clean and inspect a cylinder head assembly
5. Recondition cylinder head

E. Engine Crankshaft, Bearings & Oil Pump
1. Check main bearing bore alignment
2. Measure and inspect a crankshaft
3. Fit a crankshaft bearing with plastigauge
4. Install a rear main bearing seal (crankshaft removed)
5. Disassemble, clean and inspect oil pump

F. Cylinder Piston Reconditioning
1. Remove piston ring ridge from cylinder
2. Measure a cylinder for taper, wear, and out of round
3. Hone a cylinder with a glaze breaker hone
4. Clean the cylinder head surface and check for warpage
5. Remove and replace a cylinder block core plug

G. Engine Reassembly
1. Install camshaft and bearings
2. Install crankshaft, bearings, timing gears, and timing cover
3. Install pistons and connecting rod assemblies
4. Install oil pump, pickup screen and oil pan
5. Install cylinder head, intake manifold and exhaust manifold
6. Install engine accessory components

H. Engine Installation
1. Install engine with automatic transmission
2. Install engine with standard transmission
3. Adjust and start newly installed engine

I. Basic Electrical Theory
1. Calculate voltage using ohm's law
2. Calculate current flow in amperes using ohm's law
3. Calculate resistance using ohm's law
4. Construct a series circuit
5. Construct a parallel circuit

J. Battery Service
1. Clean and service a battery
2. Remove and replace a battery
3. Measure battery electrolyte with a hydrometer
4. Load test a battery
5. Charge test a battery for three minutes

K. Starting System
1. Load test a starter
2. Test starter circuit resistance
3. Test starter control circuit resistance
4. Remove and replace a starter
5. Disassemble, check and reassemble a starter
6. Disassemble and reassemble a gear reduction starter

L. Ignition System
1. Check and set ignition timing
2. Remove and replace a distributor
3. Remove and replace contact points and condenser
4. Adjust dwell on an externally adjustable distributor
5. Test and adjust distributor on distributor tester
6. Remove, inspect, service and replace spark plugs

M. Charging System
1. Remove and replace a generator
2. Disassemble, check and reassemble a generator
3. Remove and replace an alternator
4. Disassemble, check and reassemble an alternator
5. Test charging circuit resistance of an alternator
6. Test current output of an alternator
7. Test external type voltage regulator
8. Test internal type voltage regulator on vehicle

N. Chassis Wiring
1. Read a wiring diagram
2. Troubleshoot an electrical circuit
3. Install a soldered terminal
4. Install a solderless terminal
5. Splice a wire (solder method)
6. Splice a wire (solderless method)
7. Remove and replace a bulb
8. Align headlights
9. Remove and replace a sealed beam
10. Remove and replace a headlight switch
11. Remove and replace a power window motor
12. Test circuit with voltmeter
13. Test electrical motor current draw

O. Clutch Assembly
1. Adjust clutch linkage free travel
2. Remove clutch assembly
3. Inspect clutch assembly
4. Check clutch housing alignment
5. Replace clutch assembly

P. Standard Transmission
1. Remove and replace standard transmission
2. Disassemble, inspect and reassemble a three speed transmission

Q. Drive Lines
1. Remove and replace propeller shaft
2. Remove and replace a cross and roller U-joint
3. Remove and replace a ball and trunnion U-joint
4. Balance a propeller shaft
5. Check and adjust U-joint angles

R. Rear Axle
1. Measure backlash between ring gear and drive pinion
2. Test ring gear and drive pinion gear tooth contact pattern
3. Replace drive pinion seal
4. Replace ball bearing type axle shaft bearing and seal
5. Adjust drive pinion bearing preload with carrier assembly removed
6. Select pinion depth spacer with a pinion depth gauge
7. Adjust backlash and carrier bearing preload
8. Remove and replace rear axle housing assembly
9. Disassemble, inspect, reassemble and adjust an integral carrier rear axle

S. Automatic Transmission Service
1. Perform road test for [illegible] diagnosis
2. Test and remove housing, bushing and seal
3. Tune up an automatic transmission

T. Air Conditioning
1. Connect manifold gauge set into system
2. Purge the system
3. Replace condenser
4. Evacuate the system using a vacuum pump or charging station
5. Leak test the system using a halide leak detector
6. Charge the air conditioning system using pound cans
7. Remove and replace compressor crankshaft seal

U. Heaters
1. Pressure test a heater
2. Back flush a heater core
3. Remove and replace a water control valve
4. Test a blower motor for current draw

V. OTHER
1. _____
2. _____
3. _____
4. _____
5. _____

MAJOR COMPETENCY AREAS

Directions: Evaluate the trainee using the rating scale below and check the appropriate number to indicate the degree of competency. The numerical ratings of 4, 3, 2, and 1 are not intended to represent the traditional school grading system of A, B, C, and D. The descriptions associated with each of the numbers focus on level of student performance for each of the tasks listed below.

* **Rating Scale:** 4 - Skilled--can work independently with no supervision.
3 - Moderately Skilled--can perform job completely with limited supervision.
2 - Limited Skill--requires instruction and close supervision.
1 - No Exposure-no experience or knowledge in this area.

4	3	2	1		
				A	Hand Tools
				B	Arc Welding
				C	Oxyacetylene Cutting
				D	Oxyacetylene Fusion Welding
				E	Oxyacetylene Braze Welding
				F	Rules
				G	Outside Micrometer
				H	Inside Micrometer
				I	Basic Engine Principles
				J	Cooling System
				K	Engine Lubrication System
				L	Exhaust System
				M	Fuel System
				N	Wheel Bearings
				O	Tires and Wheels
				P	Wheel Balancing
				Q	Suspension System
				R	Steering System
				S	Wheel Alignment
				T	Brake System
				U	Power Disc Brake
				V	_____
				W	_____
				X	_____
				Y	_____
				Z	_____

4	3	2	1		
				A	Engine Condition Evaluation
				B	Engine Removal
				C	Engine Disassembly
				D	Valve Train/Cylinder Head Reconditioning
				E	Engine Crankshaft/Crankshaft Oil Pump
				F	Cylinder/Piston Reconditioning
				G	Engine Reassembly
				H	Engine Installation
				I	Basic Electrical Theory
				J	Battery Service
				K	Starting System
				L	Ignition System
				M	Charging System
				N	Chassis Wiring
				O	Clutch Assembly
				P	Standard Transmission
				Q	Drive Line
				R	Rear Axle
				S	Automatic Transmission Service
				T	Air Conditioning
				U	Heaters
				V	In-depth Automatic Transmission
				W	In-depth Power Steering
				X	_____
				Y	_____
				Z	_____

* Student ratings on specific competencies evaluated during the course are available upon student's written request. Parent's or guardian's signature is necessary if student is under 18 years of age.

Class Progress Chart -- Type A SAMPLE

C L A S S P R O G R E S S C H A R T

VOCATIONAL EDUCATION

COMPETENCY-BASED

STUDENT ASSESSMENT

Program Area: Auto Mechanics and Servicing

Course Title: Auto Mechanics I

O. E. Code No. 47.0604

VA Course No. 8506

INTERPRETATION OF SYMBOLS AND STUDENT SCORES

Proficiency 4: HIGHLY PROFICIENT: The student can complete task quickly and accurately, can direct others in how to do the task, and needs normal supervision (94%-100%).

Proficiency 3: COMPETENT: The student can do all parts of task, meets minimum local demands for speed and accuracy, and needs job-entry supervision (87%-93%).

Proficiency 2: PARTIALLY PROFICIENT: The student can do most parts of task, needs help only on hardest parts, may not meet local demands for speed and accuracy, and needs close supervision (79%-86%).

Proficiency 1: EXTREMELY LIMITED: The student can do simple parts of task, and needs extremely close supervision (70%-78%).

Proficiency 0: The student's degree of skill is below minimally acceptable performance level (69% or below).

Class Progress Chart - - Type A - SAMPLE (Partial List)

	DUTY/CONCEPT AREA: Servicing Electrical System						
	TASKS						
PROGRAM AREA: Auto Mechanics and Servicing COURSE TITLE: Auto Mechanics II VA. COURSE NO.: 8507	Locate and replace blown fuses	Locate and repair shorted or open circuits	Repair or replace lighting system components	Replace flasher units	Diagnose ignition switch and resistor	Diagnose and repair direction signal circuits	Test and repair indicator lamp circuitry
Students							
1.							
2.							
3.							
4.							
5.							
6.							
7.							
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11.							
12.							
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18.							
19.							
20.							
21.							
22.				1			
23.							
24.							

Class Progress Chart -- Type A

C L A S S P R O G R E S S C H A R T

VOCATIONAL EDUCATION

COMPETENCY-BASED

STUDENT ASSESSMENT

Program Area: _____

Course Title: _____

O. E. Code No. _____

VA Course No. _____

INTERPRETATION OF SYMBOLS AND STUDENT SCORES

Proficiency 4: HIGHLY PROFICIENT: The student can complete task quickly and accurately, can direct others in how to do the task, and needs normal supervision (94%-100%).

Proficiency 3: COMPETENT: The student can do all parts of task, meets minimum local demands for speed and accuracy, and needs job-entry supervision (87%-93%).

Proficiency 2: PARTIALLY PROFICIENT: The student can do most parts of task, needs help only on hardest parts, may not meet local demands for speed and accuracy, and needs close supervision (79%-86%).

Proficiency 1: EXTREMELY LIMITED: The student can do simple parts of task, and needs extremely close supervision (70%-78%).

Proficiency 0: The student's degree of skill is below minimally acceptable performance level (69% or below).

	DUTY/CONCEPT AREA:						
	TASKS						
PROGRAM AREA							
COURSE TITLE							
VA. COURSE NO.							
Students							
1.							
2.							
3.							
4.							
5.							
6.							
7.							
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22.							
23.							
24.							

VOCATIONAL EDUCATION PROGRESS CHART

SCHOOL _____

COURSE Auto Mechanics I (8506)

GRADING PERIOD _____

INSTRUCTOR _____

NO.	STUDENTS' NAMES	GENERAL SERVICE PROCEDURES: Determine year of manufacture	Adjust tire pressure	Adjust brake fluid level	Adjust coolant level	Adjust electrolyte level	Adjust steering fluid levels	Change engine oil	Change oil filter	Lubricate front & rear suspensions	Adjust differential fluid level	Adjust transmission fluid level	Steam clean engine	Pressure test cooling system	Inspect, adjust, replace fan belts	REMARKS

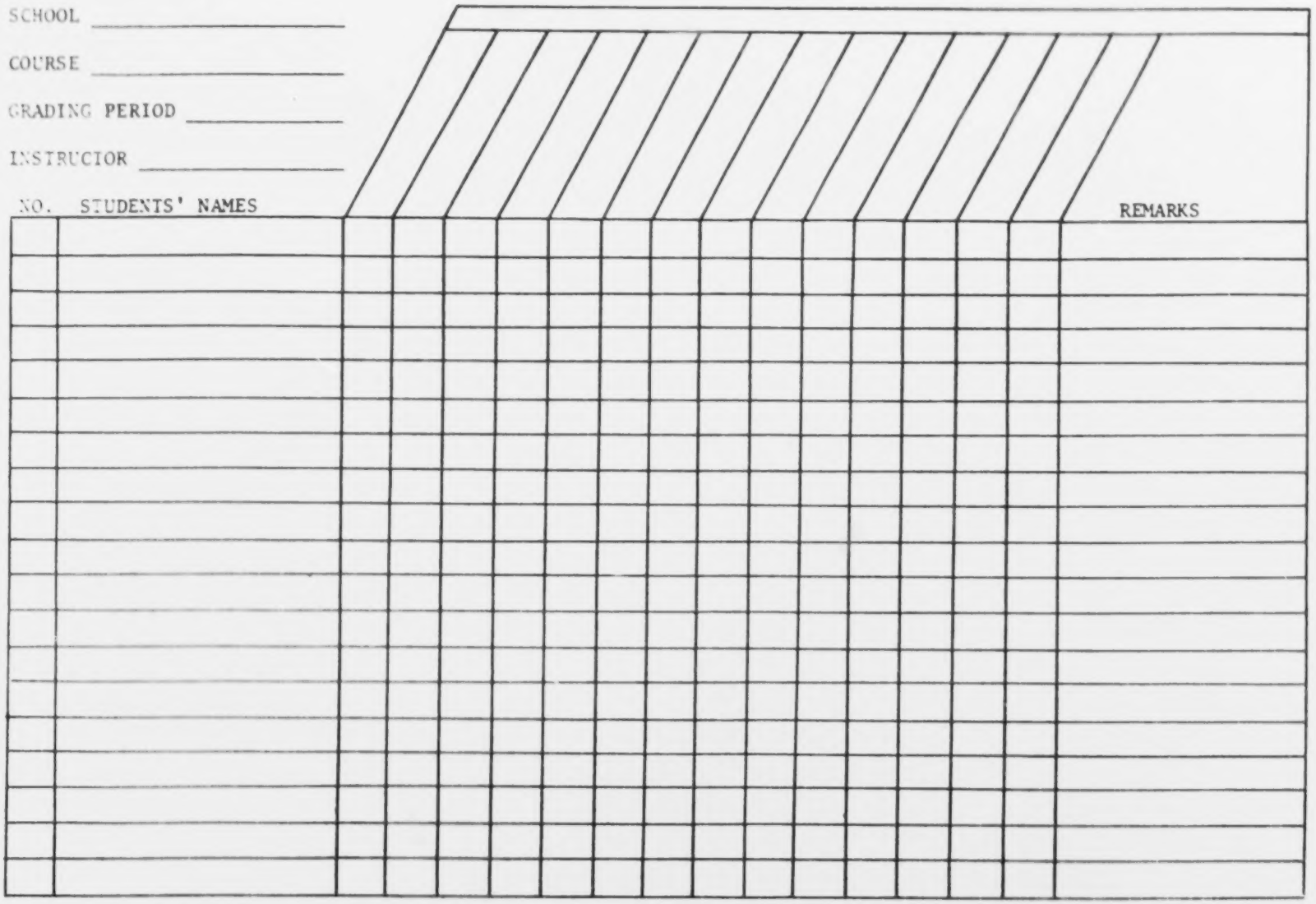
VOCATIONAL EDUCATION PROGRESS CHART

SCHOOL _____

COURSE _____

GRADING PERIOD _____

INSTRUCIOR _____



Class Progress Chart--Type B

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